



(11)

EP 3 742 848 A1

(12)

EUROPEAN PATENT APPLICATION
published in accordance with Art. 153(4) EPC

(43) Date of publication:
25.11.2020 Bulletin 2020/48

(51) Int Cl.:
H04W 72/04 (2009.01) **H04L 5/00** (2006.01)
H04W 74/08 (2009.01)

(21) Application number: **19754527.0**

(86) International application number:
PCT/CN2019/075023

(22) Date of filing: **14.02.2019**

(87) International publication number:
WO 2019/158099 (22.08.2019 Gazette 2019/34)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(72) Inventors:
• **LIU, Jianqin**
Shenzhen, Guangdong 518129 (CN)
• **GAO, Xiang**
Shenzhen, Guangdong 518129 (CN)
• **ZHOU, Yongxing**
Shenzhen, Guangdong 518129 (CN)

(30) Priority: **14.02.2018 CN 201810152230**

(74) Representative: **Pfenning, Meinig & Partner mbB**
Patent- und Rechtsanwälte
Theresienhöhe 11a
80339 München (DE)

(71) Applicant: **Huawei Technologies Co., Ltd.**
Longgang District
Shenzhen, Guangdong 518129 (CN)

(54) **RANDOM ACCESS RESOURCE CONFIGURATION METHOD AND COMMUNICATION DEVICE**

(57) This application provides a random access resource configuration method and a communications device. The method includes: receiving, by a terminal device, index indication information, where the index indication information is used to indicate a first configuration index; determining, by the terminal device based on the first configuration index, first configuration information corresponding to the first configuration index, where the first configuration information is used to indicate a time domain resource for a first group of random access preamble occasions ROs or a time domain resource for a second group of ROs; the time domain resource for the first group of ROs and the time domain resource for the second group of ROs are located in a first time unit in a random access configuration period; and the time domain resource for the first group of ROs or the time domain resource for the second group of ROs is determined based on a time domain offset of the control channel resource set and/or an index of the first time unit; and determining, by the terminal device, a time domain resource for one group of ROs, where the time domain resource for the group of ROs is the time domain resource for the first group of ROs or the time domain resource for the second group of ROs. According to embodiments of this application, random access efficiency of the terminal device can be improved.

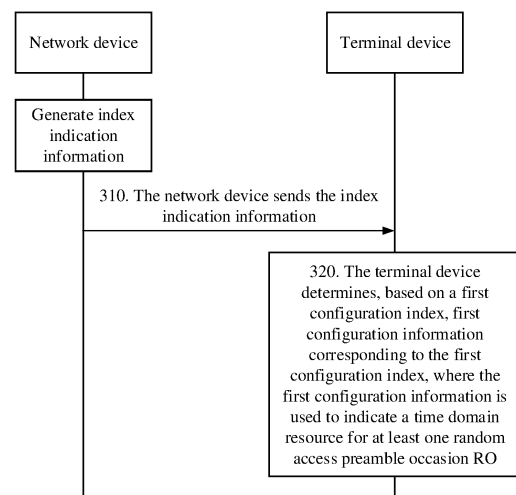


FIG. 3

EP 3 742 848 A1

Description

[0001] This application claims priority to Chinese Patent Application No. 201810152230.8, filed with the China National Intellectual Property Administration on February 14, 2018 and entitled "RANDOM ACCESS RESOURCE CONFIGURATION METHOD AND COMMUNICATIONS DEVICE", which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] This application relates to the communications field, and in particular, to a random access resource configuration method and a communications device.

BACKGROUND

[0003] A synchronization signal/broadcast channel block (Synchronous Signal/physical broadcast channel (PBCH) block, SSB) is defined in a 5th generation (5th Generation, 5G) communications system such as new radio (New radio, NR). One SSB occupies four consecutive (orthogonal frequency division multiplexing, OFDM) symbols. The SSB includes a new radio-primary synchronization signal (New radio-primary synchronization signal, NPSS), a new radio narrowband-secondary synchronization signal (New radio-secondary synchronization signal, NR-SSS), and a new radio-physical broadcast channel (New radio-physical broadcast channel, NR-PBCH).

[0004] A terminal device needs to search for a cell and obtain cell system information, to access a network. For example, the terminal device may search for the foregoing SSB, to achieve downlink synchronization with a cell. Then, the terminal device needs to obtain cell system information (system information), and establish a connection to the cell through a random access procedure (random access procedure), to achieve uplink synchronization. Specifically, the terminal device may send a random access preamble sequence (preamble) on a resource for a random access occasion (physical random access occasion, RO) that is configured on a network device, to initiate random access.

[0005] Currently, in NR, only a physical random access channel (physical random access channel, PRACH) configuration in a frequency band below 6 GHz in a frequency division duplex (frequency division duplex, FDD) system and a PRACH configuration of a long preamble sequence in a frequency band below 6 GHz in a time division duplex (time division duplex, TDD) system are specified in an existing protocol. Because there is a relatively large difference between configurations of SSBs and remaining minimum system information (remaining minimum system information, RMSI) that correspond to different frequency bands or different systems, parameter designs in configurations in the frequency bands below 6 GHz cannot be directly applied to a PRACH configuration in another frequency band or another system; otherwise, there are a relatively small quantity of valid ROs in a PRACH configuration period, and random access efficiency of the terminal device is lowered.

[0006] Therefore, how to improve random access efficiency of a terminal device becomes an urgent problem to be resolved.

SUMMARY

[0007] This application provides a random access resource configuration method and a communications device. According to the method, random access efficiency of a terminal device can be improved.

[0008] According to a first aspect, a communication method is provided. The method includes: receiving, by a terminal device, index indication information, where the index indication information is used to indicate a first configuration index; and determining, by the terminal device based on the first configuration index, first configuration information corresponding to the first configuration index, where the first configuration information is used to indicate a time domain resource for at least one random access preamble occasion RO, and the first configuration information is determined based on time domain information of a control channel resource set.

[0009] Therefore, in this embodiment of this application, the time domain resource for the RO is determined based on a time domain resource for a common signal block and/or the time domain information of the control channel resource set, thereby reducing a probability that the resource for the RO collides with a downlink resource (for example, an SSB and/or an RMSI CORESET), increasing a quantity of valid ROs in a PRACH configuration period, and improving random access efficiency of the terminal device.

[0010] According to a second aspect, a communication method is provided. The method includes: generating, by a network device, index indication information, where the index indication information is used to indicate a first configuration index; and sending, by the network device, the index indication information to a terminal device, where the index indication information is used by the terminal device to determine, based on the first configuration index, first configuration information corresponding to the first configuration index; the first configuration information is used to indicate a time domain resource for at least one random access preamble occasion RO; and the first configuration information is determined

based on a time domain resource for a common signal block and/or time domain information of a control channel resource set.

[0011] Therefore, in this embodiment of this application, the time domain resource for the RO is determined based on the time domain resource for the common signal block and/or the time domain information of the control channel resource set, thereby reducing a probability that the resource for the RO collides with a downlink resource (for example, an SSB and/or an RMSI CORESET), increasing a quantity of valid ROs in a PRACH configuration period, and improving random access efficiency of the terminal device.

[0012] Optionally, with reference to the first aspect or the second aspect, in an implementation, the first configuration information includes at least one of the following information:

- first indication information used to indicate a first time unit in a random access configuration period;
- second indication information used to indicate at least one second time unit in the first time unit;
- third indication information used to indicate a quantity of third time units included in each of the at least one second time unit;
- fourth indication information used to indicate a quantity of ROs in the third time unit; and
- fifth indication information used to indicate a starting time domain position of an RO in the third time unit.

[0013] Optionally, with reference to the first aspect or the second aspect, in an implementation, the random access configuration period is greater than a preset duration threshold, the time domain information of the control channel resource set includes a time domain offset of the control channel resource set, and the time domain offset of the control channel resource set indicates duration between a starting time domain position of a control channel resource set associated with the first common signal block in the common signal block detection window and a starting position of a system frame in which the control channel resource set is located; and the first indication information used to indicate the first time unit is determined based on the time domain offset of the control channel resource set.

[0014] Optionally, with reference to the first aspect or the second aspect, in an implementation, when the time domain offset of the control channel resource set is greater than or equal to a preset offset threshold, a sequence number corresponding to a position of the first time unit indicated by the first indication information in the random access configuration period is an even number; or when the time domain offset of the control channel resource set is less than the preset offset threshold, a sequence number corresponding to a position of the first time unit indicated by the first indication information in the random access configuration period is an odd number.

[0015] Therefore, in the embodiments of this application, a position of a first time unit (namely, a system frame) to which the time domain resource for the RO belongs is determined based on a value of the time domain offset of the control channel resource set, thereby avoiding a conflict with a control channel resource to the greatest extent, increasing a quantity of valid ROs, and improving random access efficiency.

[0016] Optionally, with reference to the first aspect or the second aspect, in an implementation, the second indication information used to indicate the at least one second time unit is determined based on a time domain position of the common signal block.

[0017] Optionally, with reference to the first aspect or the second aspect, in an implementation, the at least one second time unit indicated by the second indication information is located at a time domain position other than an optional time domain position of the common signal block in the first time unit.

[0018] Therefore, in the embodiments of this application, a second time unit to which the time domain resource for the RO belongs is determined based on the time domain position of the common signal block, thereby avoiding a conflict with the time domain position of the common signal block to the greatest extent, increasing a quantity of valid ROs, and improving random access efficiency.

[0019] Optionally, with reference to the first aspect or the second aspect, in an implementation, the second indication information used to indicate the at least one second time unit is determined based on an optional time domain position of the common signal block and/or an index of the first time unit.

[0020] Optionally, with reference to the first aspect or the second aspect, in an implementation, the at least one second time unit includes a first group of second time units and a second group of second time units; the first group of second time units is located at a time domain position other than an optional time domain position of the common signal block in the first half time domain part of the first time unit; the second group of second time units is located at a time domain position other than an optional time domain position of the common signal block in the second half time domain part of the first time unit; and when the index of the first time unit is an even number, the time domain resource for the at least one random access preamble occasion RO belongs to the first group of second time units indicated by the second indication information; or when the index of the first time unit is an odd number, the time domain resource for the at least one random access preamble occasion RO belongs to the second group of second time units indicated by the second indication information.

[0021] Optionally, with reference to the first aspect or the second aspect, in an implementation, the preset offset

threshold is one of 2, 2.5, 5, 7, and 7.5.

[0022] Optionally, with reference to the first aspect or the second aspect, in an implementation, the time domain information of the control channel resource set includes a time domain position of the control channel resource set in the third time unit; and the fifth indication information used to indicate the starting time domain position of the RO in the third time unit is determined based on a time domain position of the control channel resource set in the third time unit, and the starting time domain position of the RO in the third time unit is after a time domain position of a preset control channel resource set in the third time unit; or the starting time domain position that is of the RO in the third time unit and that is indicated by the fifth indication information is a starting time domain position of the third time unit or a preset time domain position in the third time unit.

[0023] Optionally, with reference to the first aspect or the second aspect, in an implementation, the starting time domain position of the RO indicates a position, in the third time unit, of the first fourth time unit in at least one fourth time unit that is in the third time unit and that is occupied by the RO; and when the starting time domain position of the RO in the third time unit is after a time domain position of the last control channel resource set in the third time unit, a value of a sequence number of the fourth time unit corresponding to the starting time domain position of the RO in the third time unit is one of the following three: one time a time domain length of the control channel resource set in the third time unit; twice the time domain length of the control channel resource set in the third time unit; and a sum of a sequence number of a starting fourth time unit in the control channel resource set in the third time unit and one time the time domain length of the control channel resource set.

[0024] Therefore, in the embodiments of this application, a position of the time domain resource for the RO is determined based on the time domain position of the control channel resource set, thereby avoiding a conflict with a control channel resource to the greatest extent, increasing a quantity of valid ROs, and improving random access efficiency.

[0025] Optionally, with reference to the first aspect or the second aspect, in an implementation, the fourth indication information used to indicate the quantity of ROs in the third time unit is determined based on the starting time domain position of the RO in the third time unit and a length of a time domain resource occupied by the preamble sequence.

[0026] Optionally, with reference to the first aspect or the second aspect, in an implementation, the quantity that is of ROs in the third time unit and that is indicated by the fourth indication information is less than or equal to a ratio of a length of a time domain resource between the starting time domain position of the RO and an ending time domain position of the third time unit to the length of the time domain resource occupied by the preamble sequence.

[0027] Optionally, with reference to the first aspect or the second aspect, in an implementation, the first time unit is a system frame; the second time unit is a subframe or is of 0.25 ms; and the third time unit is a slot.

[0028] Optionally, in an implementation of the first aspect, the method further includes: sending, by the terminal device, a preamble sequence on the time domain resource for the at least one RO that is configured by using the first configuration information.

[0029] Therefore, in the embodiments of this application, the time domain resource for the RO is determined based on the time domain resource for the common signal block and/or the time domain information of the control channel resource set, thereby reducing a probability that the resource for the RO collides with a downlink resource (for example, an SSB and/or an RMSI CORESET), increasing a quantity of valid ROs in a PRACH configuration period, and improving random access efficiency of the terminal device.

[0030] Optionally, in an implementation of the first aspect, when time domain resources for one or more ROs in the time domain resource for the at least one RO conflict with a time domain resource for the common signal block or a time domain resource for the control channel resource set, the method further includes:

skipping, by the terminal device, sending the preamble sequence on the time domain resources for the one or more ROs that conflict with the time domain resource for the common signal block or the time domain resource for the control channel resource set.

[0031] Optionally, the terminal device receives the time domain resource for the common signal block or the time domain resource for the control channel resource set on the time domain resources for the one or more ROs that conflict with the time domain resource for the common signal block or the time domain resource for the control channel resource set.

[0032] Therefore, in the embodiments of this application, when a resource conflict exists, a preamble sequence is not sent on a conflicting resource, thereby avoiding unnecessary and useless work, and avoiding a random access failure.

[0033] Optionally, in an implementation of the first aspect, when time domain resources for one or more ROs in the time domain resource for the at least one RO are located on a non-uplink resource in a semi-static uplink/downlink configuration, the method further includes:

sending, by the terminal device, a preamble sequence on the time domain resource for the at least one RO that is configured by using the first configuration information.

[0034] Therefore, in the embodiments of this application, the preamble sequence is still sent when a selected time domain resource for one group of ROs does not match the semi-static uplink/downlink configuration, thereby improving a success rate of random access.

[0035] Optionally, in an implementation of the second aspect, when time domain resources for one or more ROs in the time domain resource for the at least one RO conflict with a time domain resource for the common signal block or a time domain resource for the control channel resource set, the method further includes:

skipping, by the network device, receiving the preamble sequence on the time domain resources for the one or more ROs that conflict with the time domain resource for the common signal block or the time domain resource for the control channel resource set.

[0036] Optionally, the network device sends the time domain resource for the common signal block or the time domain resource for the control channel resource set on the time domain resources for the one or more ROs that conflict with the time domain resource for the common signal block or the time domain resource for the control channel resource set.

[0037] Optionally, in an implementation of the second aspect, when time domain resources for one or more ROs in the time domain resource for the at least one RO are located on a non-uplink resource in a semi-static uplink/downlink configuration, the method further includes:

receiving, by the network device on the time domain resource for the at least one RO that is configured by using the first configuration information, a preamble sequence sent by the terminal device.

[0038] Optionally, the network device does not receive an uplink/downlink signal, other than the preamble sequence, sent by the terminal device on the determined time domain resource for the group of ROs.

[0039] According to a third aspect, a communication method is provided. The method includes: receiving, by a terminal device, index indication information, where the index indication information is used to indicate a first configuration index; determining, by the terminal device based on the first configuration index, first configuration information corresponding to the first configuration index, where the first configuration information is used to indicate a time domain resource for a first group of random access preamble occasions ROs or a time domain resource for a second group of ROs; the time domain resource for the first group of ROs and the time domain resource for the second group of ROs are located in a first time unit in a random access configuration period; and the time domain resource for the first group of ROs or the time domain resource for the second group of ROs is determined based on a time domain offset of the control channel resource set and/or an index of the first time unit; and determining, by the terminal device, a time domain resource for one group of ROs, where the time domain resource for the group of ROs is the time domain resource for the first group of ROs or the time domain resource for the second group of ROs.

[0040] According to a fourth aspect, a communication method is provided. The method includes: generating, by a network device, index indication information, where the index indication information is used to indicate a first configuration index; and sending, by the network device, the index indication information to a terminal device, where the index indication information is used by the terminal device to determine, based on the first configuration index, first configuration information corresponding to the first configuration index; the first configuration information is used to indicate a time domain resource for a first group of random access preamble occasions ROs or a time domain resource for a second group of ROs, so that the terminal device determines a time domain resource for one group of ROs; the time domain resource for the group of ROs is the time domain resource for the first group of ROs or the time domain resource for the second group of ROs; the time domain resource for the first group of ROs and the time domain resource for the second group of ROs are located in a first time unit in a random access configuration period; and the time domain resource for the first group of ROs or the time domain resource for the second group of ROs is determined based on a time domain offset of the control channel resource set and/or an index of the first time unit.

[0041] Specifically, the network device may first determine a time domain resource for a common signal block and/or time domain information of the control channel resource set, and then the network device may determine the time domain resource for the RO (that is, determine configuration information corresponding to the time domain resource for the RO) based on the time domain resource for the common signal block and/or the time domain information of the control channel resource set. Subsequently, the network device may determine, based on the prestored one-to-one correspondence between a plurality of configuration indexes and a plurality of sets of configuration information, a configuration index corresponding to the time domain resource for the RO. Finally, the network device configures the first configuration index for the terminal device by using the index indication information. Further, the terminal device may determine, in the prestored one-to-one correspondence between a plurality of configuration indexes and a plurality of sets of configuration information based on the first configuration index, the first configuration information corresponding to the first configuration index, and then the terminal device may determine the time domain resources for the two groups of ROs based on the first configuration information, and select a time domain resource for one group of ROs from the time domain resources for the two groups of ROs.

[0042] Therefore, in the embodiments of this application, the time domain resource for the RO is determined based on the time domain offset of the control channel resource set and/or the index of the first time unit, thereby reducing a probability that the resource for the RO collides with a downlink resource (for example, an SSB and/or an RMSI CORE-SET), increasing a quantity of valid ROs in a PRACH configuration period, and improving random access efficiency of the terminal device.

[0043] Optionally, with reference to the third aspect or the fourth aspect, in an implementation, the first configuration

information includes at least one of the following information: first indication information used to indicate the first time unit in the random access configuration period; second indication information used to indicate at least one second time unit in the first time unit, where the at least one second time unit includes a first group of second time units and a second group of second time units, the time domain resource for the first group of ROs belongs to the first group of second time units, and the time domain resource for the second group of ROs belongs to the second group of second time units; third indication information used to indicate a quantity of third time units included in each second time unit in the first group of second time units and the second group of second time units; fourth indication information used to indicate a quantity of ROs in the third time unit; and fifth indication information used to indicate a starting time domain position of an RO in the third time unit.

[0044] Optionally, with reference to the third aspect or the fourth aspect, in an implementation, the random access configuration period is greater than a preset duration threshold, and the time domain offset of the control channel resource set indicates duration between a starting time domain position of a control channel resource set associated with the first common signal block in the common signal block detection window and a starting position of a system frame in which the control channel resource set is located; and

the first indication information used to indicate the first time unit is determined based on the time domain offset of the control channel resource set.

[0045] Optionally, with reference to the third aspect or the fourth aspect, in an implementation, when the time domain offset of the control channel resource set is greater than or equal to a preset offset threshold, a sequence number corresponding to a position of the first time unit indicated by the first indication information in the random access configuration period is an even number; or

when the time domain offset of the control channel resource set is less than the preset offset threshold, a sequence number corresponding to a position of the first time unit indicated by the first indication information in the random access configuration period is an odd number.

[0046] Optionally, with reference to the third aspect or the fourth aspect, in an implementation, the second indication information used to indicate the at least one second time unit is determined based on a time domain position of the common signal block.

[0047] Optionally, with reference to the third aspect or the fourth aspect, in an implementation, the at least one second time unit indicated by the second indication information is located at a time domain position other than an optional time domain position of the common signal block in the first time unit.

[0048] Optionally, with reference to the third aspect or the fourth aspect, in an implementation, the second indication information used to indicate the at least one second time unit is determined based on an optional time domain position of the common signal block and/or the index of the first time unit.

[0049] Optionally, with reference to the third aspect or the fourth aspect, in an implementation, the first group of second time units is located at a time domain position other than an optional time domain position of the common signal block in the first half time domain part of the first time unit;

the second group of second time units is located at a time domain position other than an optional time domain position of the common signal block in the second half time domain part of the first time unit; and

the determining, by the terminal device, a time domain resource for one group of ROs includes:

determining, by the terminal device, the time domain resource for the group of ROs based on the index of the first time unit, where when the index of the first time unit is an even number, the time domain resource for the group of ROs that is determined by the terminal device is the time domain resource for the first group of ROs; or when the index of the first time unit is an odd number, the time domain resource for the group of ROs that is determined by the terminal device is the time domain resource for the second group of ROs.

[0050] Optionally, with reference to the third aspect or the fourth aspect, in an implementation, the preset offset threshold is one of 2, 2.5, 5, 7, and 7.5.

[0051] Optionally, with reference to the third aspect or the fourth aspect, in an implementation, the fifth indication information used to indicate the starting time domain position of the RO in the third time unit is determined based on a time domain position of the control channel resource set in the third time unit, and the starting time domain position of the RO in the third time unit is after a time domain position of a preset control channel resource set in the third time unit; or the starting time domain position that is of the RO in the third time unit and that is indicated by the fifth indication information is a starting time domain position of the third time unit or a preset time domain position in the third time unit.

[0052] Optionally, with reference to the third aspect or the fourth aspect, in an implementation, the starting time domain position of the RO indicates a position, in the third time unit, of the first fourth time unit in at least one fourth time unit that is in the third time unit and that is occupied by the RO; and when the starting time domain position of the RO in the third time unit is after a time domain position of the last control channel resource set in the third time unit, a value of a sequence number of the fourth time unit corresponding to the starting time domain position of the RO in the third time unit is one of the following three:

one time a time domain length of the control channel resource set in the third time unit;
 twice the time domain length of the control channel resource set in the third time unit; and
 a sum of a sequence number of a starting fourth time unit in the control channel resource set in the third time unit
 and one time the time domain length of the control channel resource set.

[0053] Optionally, with reference to the third aspect or the fourth aspect, in an implementation, the fourth indication information used to indicate the quantity of ROs in the third time unit is determined based on the starting time domain position of the RO in the third time unit and a length of a time domain resource occupied by the preamble sequence.

[0054] Optionally, with reference to the third aspect or the fourth aspect, in an implementation, the quantity that is of ROs in the third time unit and that is indicated by the fourth indication information is less than or equal to a ratio of a length of a time domain resource between the starting time domain position of the RO and an ending time domain position of the third time unit to the length of the time domain resource occupied by the preamble sequence.

[0055] Optionally, with reference to the third aspect or the fourth aspect, in an implementation, the first time unit is a system frame; the second time unit is a subframe or is of 0.25 ms; and the third time unit is a slot.

[0056] Optionally, with reference to the third aspect, in an implementation, the method further includes: sending, by the terminal device, a preamble sequence on the determined time domain resource for the group of ROs.

[0057] Optionally, with reference to the third aspect, in an implementation, when time domain resources for one or more ROs in the time domain resource for the group of ROs that is determined by the terminal device conflict with a time domain resource for the common signal block or a time domain resource for the control channel resource set, the method further includes:

skipping, by the terminal device, sending the preamble sequence on the time domain resources for the one or more ROs that conflict with the time domain resource for the common signal block or the time domain resource for the control channel resource set.

[0058] Optionally, the terminal device receives the time domain resource for the common signal block or the time domain resource for the control channel resource set on the time domain resources for the one or more ROs that conflict with the time domain resource for the common signal block or the time domain resource for the control channel resource set.

[0059] Optionally, with reference to the third aspect, in an implementation, when time domain resources for one or more ROs in the time domain resource for the group of ROs that is determined by the terminal device are located on a non-uplink resource in a semi-static uplink/downlink configuration, the method further includes:

sending, by the terminal device, a preamble sequence on the determined time domain resource for the group of ROs.

[0060] Optionally, with reference to the fourth aspect, in an implementation, the method further includes: receiving, by the network device, a preamble sequence that is sent by the terminal device on the determined time domain resource for the group of ROs.

[0061] Optionally, with reference to the fourth aspect, in an implementation, when time domain resources for one or more ROs in the time domain resource for the group of ROs that is determined by the terminal device conflict with a time domain resource for the common signal block or a time domain resource for the control channel resource set, the method further includes:

skipping, by the network device, receiving the preamble sequence on the time domain resources for the one or more ROs that conflict with the time domain resource for the common signal block or the time domain resource for the control channel resource set.

[0062] Optionally, the network device sends the time domain resource for the common signal block or the time domain resource for the control channel resource set on the time domain resources for the one or more ROs that conflict with the time domain resource for the common signal block or the time domain resource for the control channel resource set.

[0063] Optionally, with reference to the fourth aspect, in an implementation, when time domain resources for one or more ROs in the time domain resource for the group of ROs that is determined by the terminal device are located on a non-uplink resource in a semi-static uplink/downlink configuration, the method further includes: receiving, by the network device, a preamble sequence that is sent by the terminal device on the time domain resource for the group of ROs.

[0064] Optionally, the network device does not receive an uplink/downlink signal, other than the preamble sequence, sent by the terminal device on the determined time domain resource for the group of ROs.

[0065] According to a fifth aspect, a communication method is provided. The method includes: receiving, by a terminal device, index indication information, where the index indication information is used to indicate a first configuration index; determining, by the terminal device based on the first configuration index, a time domain resource for at least one random access preamble occasion RO corresponding to the first configuration index; and when the terminal device determines that time domain resources for one or more ROs in the time domain resource for the at least one RO conflict with a time domain resource for a common signal block or a time domain resource for a control channel resource set, skipping, by the terminal device, sending the preamble sequence on the time domain resources for the one or more ROs that conflict

with the time domain resource for the common signal block or the time domain resource for the control channel resource set; or when the terminal device determines that time domain resources for one or more ROs in the time domain resource for the at least one RO are located on a non-uplink resource in a semi-static uplink/downlink configuration, sending, by the terminal device, a preamble sequence on the time domain resource for the at least one RO.

[0066] According to a sixth aspect, a communication method is provided. The method includes: generating, by a network device, index indication information, where the index indication information is used to indicate a first configuration index; sending, by the network device, the index indication information to a terminal device, where the index indication information is used by the terminal device to determine, based on the first configuration index, a time domain resource for at least one random access preamble occasion RO corresponding to the first configuration index; and when the network determines that time domain resources for one or more ROs in the time domain resource for the at least one RO conflict with a time domain resource for a common signal block or a time domain resource for a control channel resource set, skipping, by the network device, receiving the preamble sequence on the time domain resources for the one or more ROs that conflict with the time domain resource for the common signal block or the time domain resource for the control channel resource set; or when the network device determines that time domain resources for one or more ROs in the time domain resource for the at least one RO are located on a non-uplink resource in a semi-static uplink/downlink configuration, receiving, by the network device, a preamble sequence that is sent by the terminal device on the time domain resource for the at least one RO that is configured by using the first configuration information.

[0067] Therefore, in the embodiments of this application, when a resource conflict exists, a preamble sequence is not sent on a conflicting resource, thereby avoiding unnecessary and useless work, and avoiding a random access failure. In addition, in the embodiments of this application, the preamble sequence is still sent when a selected time domain resource for one group of ROs does not match the semi-static uplink/downlink configuration, thereby improving a success rate of random access.

[0068] According to a seventh aspect, a terminal device is provided. The terminal device includes modules or units configured to perform the method according to any one of the first aspect, the third aspect, the fifth aspect, or the possible implementations of the first aspect, the third aspect, or the fifth aspect.

[0069] According to an eighth aspect, a network device is provided. The network device includes modules or units configured to perform the method according to any one of the second aspect, the fourth aspect, the sixth aspect, or the possible implementations of the second aspect, the fourth aspect, or the sixth aspect.

[0070] According to a ninth aspect, a terminal device is provided. The terminal device includes a transceiver, a processor, and a memory. The processor is configured to control the transceiver to receive and send a signal. The memory is configured to store a computer program. The processor is configured to invoke the computer program from the memory and run the computer program, so that the terminal device performs the method according to any one of the first aspect, the third aspect, the fifth aspect, or the possible implementations of the first aspect, the third aspect, or the fifth aspect.

[0071] According to a tenth aspect, a network device is provided. The network device includes a transceiver, a processor, and a memory. The processor is configured to control the transceiver to receive and send a signal. The memory is configured to store a computer program. The processor is configured to invoke the computer program from the memory and run the computer program, so that the terminal device performs the method according to any one of the second aspect, the fourth aspect, the sixth aspect, or the possible implementations of the second aspect, the fourth aspect, or the sixth aspect.

[0072] According to an eleventh aspect, a computer-readable medium is provided. The computer-readable medium stores a computer program. When the computer program is executed by a computer, the method according to any one of the first aspect to the sixth aspect or the possible implementations of the first aspect to the sixth aspect is implemented.

[0073] According to a twelfth aspect, a computer program product is provided. When the computer program product is executed by a computer, the method according to any one of the first aspect to the sixth aspect or the possible implementations of the first aspect to the sixth aspect is implemented.

[0074] According to a thirteenth aspect, a processing apparatus is provided. The processing apparatus includes a processor and an interface.

[0075] The processor is configured to perform the method according to any one of the first aspect to the sixth aspect or the possible implementations of the first aspect to the sixth aspect. A related data exchange process (for example, performing data transmission or receiving transmitted data) is completed by using the foregoing interface. In a specific implementation process, the interface may further complete the foregoing data exchange process by using a transceiver.

[0076] It should be understood that, the processing apparatus according to the thirteenth aspect may be a chip. The processor may be implemented by using hardware, or may be implemented by using software. When the processor is implemented by using the hardware, the processor may be a logic circuit, an integrated circuit, or the like; or when the processor is implemented by using the software, the processor may be a general-purpose processor, and is implemented by reading software code stored in the memory. The memory may be integrated into the processor, or may be located outside the processor, and exist independently.

BRIEF DESCRIPTION OF DRAWINGS

[0077]

FIG. 1 is a schematic diagram of a scenario of a communications system to which an embodiment of this application is applicable;
 FIG. 2 is a schematic diagram of a multiplexing pattern of an SSB and an RMSI CORESET according to an embodiment of this application;
 FIG. 3 is a schematic flowchart of a communication method according to an embodiment of this application;
 FIG. 4 is a schematic distribution diagram of SSB and RMSI CORESET resources according to an embodiment of this application;
 FIG. 5 is a schematic distribution diagram of SSB and RMSI CORESET resources according to an embodiment of this application;
 FIG. 6 is a schematic diagram of a resource configuration in a slot according to an embodiment of this application;
 FIG. 7 is a schematic flowchart of a communication method according to another embodiment of this application;
 FIG. 8 is a schematic flowchart of a communication method according to another embodiment of this application;
 FIG. 9 is a schematic block diagram of a terminal device according to an embodiment of this application;
 FIG. 10 is a schematic block diagram of a network device according to an embodiment of this application;
 FIG. 11 is a schematic block diagram of a terminal device according to another embodiment of this application; and
 FIG. 12 is a schematic block diagram of a network device according to another embodiment of this application.

DESCRIPTION OF EMBODIMENTS

[0078] The following describes technical solutions of this application with reference to the accompanying drawings.

[0079] Embodiments of this application are applicable to various communications systems. Therefore, the following descriptions are not limited to a particular communications system. A next-generation communications system is a 5th generation (5th generation, 5G) communications system, such as a new radio (new radio, NR) system.

[0080] In the embodiments of this application, a network device may be a network side device in a future 5G network, for example, a transmission point (TRP or TP) in an NR system, a gNB (gNB) in an NR system, or a radio frequency unit in an NR system, such as a remote radio unit or one antenna panel or a group of antenna panels (including a plurality of antenna panels) of a base station in a 5G system. Different network devices may be located in a same cell, or may be located in different cells. This is not specifically limited herein.

[0081] In some deployments, the gNB may include a centralized unit (centralized unit, CU) and a distributed unit (Distributed Unit, DU). The gNB may further include a radio unit (radio unit, RU). The CU implements some functions of the gNB, and the DU implements some functions of the gNB. For example, the CU implements functions of a radio resource control (radio resource control, RRC) layer and a packet data convergence protocol (packet data convergence protocol, PDCP) layer, and the DU implements functions of a radio link control (radio link control, RLC) layer, a media access control (media access control, MAC) layer, and a physical (physical, PHY) layer. Information on the RRC layer eventually becomes information on the PHY layer, or is converted from information on the PHY layer. Therefore, in this architecture, higher layer signaling, such as RRC layer signaling or PHCP layer signaling, may also be considered as being sent by the DU or sent by the DU and the RU. It may be understood that the network device may be a CU node, a DU node, or a device including a CU node and a DU node. In addition, the CU may be classified into a network device in an access network RAN, or the CU may be classified into a network device in a core network CN. This is not limited herein.

[0082] The terminal device in the embodiments of this application may also be referred to as user equipment (user equipment, UE), an access terminal, a subscriber unit, a subscriber station, a mobile station, a mobile console, a remote station, a remote terminal, a mobile device, a user terminal, a terminal, a wireless communications device, a user agent, a user apparatus, or the like. The access terminal may be a cellular phone, a cordless phone, a session initiation protocol (session initiation protocol, SIP) phone, a wireless local loop (wireless local loop, WLL) station, a personal digital assistant (personal digital assistant, PDA), a handheld device having a wireless communication function, a computing device, another processing device connected to a wireless modem, a vehicle-mounted device, a wearable device, a drone device, a terminal device in a future 5G network, or a terminal device in a future evolved public land mobile network (public land mobile network, PLMN). This is not limited in the embodiments of this application.

[0083] By way of example but not limitation, in the embodiments of the present invention, the terminal device may also be a wearable device. The wearable device may also be referred to as a wearable intelligent device, and is a generic name of wearable devices developed by intelligently designing daily wear by using a wearable technology, such as glasses, gloves, a watch, clothing, or shoes. A wearable device is a portable device that can be directly worn on a body or integrated into clothes or an accessory of a user. The wearable device is not merely a hardware device, and further

implements powerful functions through software support, data exchange, and cloud interaction. Generalized wearable intelligent devices include full-featured and large-size devices that can implement complete or partial functions without depending on smartphones, such as smart watches or smart glasses, and devices that focus on only one type of application function and need to work with other devices such as smartphones, such as various smart bands or smart jewelry for monitoring physical signs.

[0084] The embodiments of this application are applicable to any one of the foregoing communications systems. For example, the embodiments of this application are applicable to an LTE system and a subsequent evolved system such as 5G, or other wireless communications systems using various radio access technologies, for example, a system using an access technology such as code division multiple access, frequency division multiple access, orthogonal frequency division multiple access, or single-carrier frequency division multiple access, especially applicable to a scenario in which a channel information feedback is required and/or a two-stage precoding technology is applied, for example, a wireless network to which a massive array antenna (Massive Multiple-Input Multiple-Output, Massive MIMO) technology is applied, or a wireless network to which a distributed antenna technology is applied.

[0085] It should be understood that the term "and/or" in this specification describes only an association relationship for describing associated objects and represents that three relationships may exist. For example, A and/or B may represent the following three cases: Only A exists, both A and B exist, and only B exists.

[0086] FIG. 1 is a schematic diagram of a scenario of a communications system to which an embodiment of this application is applicable. As shown in FIG. 1, the communications system 100 includes a network side device 102 and a plurality of terminal devices (such as a terminal device 116 and a terminal device 122). The network side device 102 may provide a communications service for the terminal device and access a core network. The terminal device accesses a network by searching for a synchronization signal, a broadcast signal, or the like that is sent by the network device, to communicate with the network, for example, perform uplink/downlink transmission.

[0087] Specifically, the network side device 102 may include a plurality of antenna groups. Each antenna group may include a plurality of antennas. For example, one antenna group may include antennas 104 and 106, another antenna group may include antennas 106 and 110, and an additional group may include antennas 112 and 114. FIG. 1 shows two antennas for each antenna group, but each group may include more or fewer antennas. The network side device 102 may additionally include a transmitter chain and a receiver chain. A person of ordinary skill in the art may understand that both the transmitter chain and the receiver chain may include a plurality of components (for example, a processor, a modulator, a multiplexer, a demodulator, a demultiplexer, or an antenna) related to signal sending and receiving.

[0088] The network side device 102 may communicate with a plurality of terminal devices (such as the terminal device 116 and the terminal device 122). However, it may be understood that the network side device 102 may communicate with any quantity of terminal devices similar to the terminal device 116 or 122.

[0089] As shown in FIG. 1, the terminal device 116 communicates with the antennas 112 and 114. The antennas 112 and 114 send information to the terminal device 116 through a forward link 116, and receive information from the terminal device 116 through a reverse link 120. In addition, the terminal device 122 communicates with the antennas 104 and 106. The antennas 104 and 106 send information to the terminal device 122 through a forward link 124, and receive information from the terminal device 122 through a reverse link 126.

[0090] For example, in a frequency division duplex (frequency division duplex, FDD) system, for example, the forward link 116 may use a frequency band different from that used by the reverse link 120, and the forward link 124 may use a frequency band different from that used by the reverse link 126.

[0091] For another example, in a time division duplex (time division duplex, TDD) system and a full duplex (full duplex) system, the forward link 116 and the reverse link 120 may use a same frequency band, and the forward link 124 and the reverse link 126 may use a same frequency band.

[0092] Each antenna group and/or area designed for communication is referred to as a sector of the network side device 102. For example, an antenna group may be designed to communicate with a terminal device in a sector within coverage of the network side device 102. In a process in which the network side device 102 communicates with the terminal devices 116 and 122 by using the forward links 116 and 124 respectively, a transmit antenna of the network side device 102 may increase signal-to-noise ratios of the forward links 116 and 124 through beamforming. In addition, compared with a manner in which the network side device sends signals to all terminal devices of the network side device by using a single antenna, when the network side device 102 sends, through beamforming, signals to the terminal devices 116 and 122 that are randomly distributed within related coverage, a mobile device in a neighboring cell is subject to relatively less interference.

[0093] At a given time, the network side device 102, the terminal device 116, or the terminal device 122 may be a wireless communications sending apparatus and/or a wireless communications receiving apparatus. When sending data, the wireless communications sending apparatus may encode the data for transmission. Specifically, the wireless communications sending apparatus may obtain (for example, generate, receive from another communications apparatus, or store in a memory) a specific quantity of data bits that need to be sent to the wireless communications receiving apparatus through a channel. The data bits may be included in a transport block (or a plurality of transport blocks) of

data, and the transport block may be segmented to generate a plurality of code blocks.

[0094] In addition, the communications system 100 may be a public land mobile network PLMN network, a device-to-device (device to device, D2D) network, a machine-to-machine (machine to machine, M2M) network, or another network. FIG. 1 is merely a simplified schematic diagram of an example used for ease of understanding, and the network may further include another network device that is not shown in FIG. 1.

[0095] As described above, when the terminal device needs to access a network (for example, after the terminal device is powered on, or when the terminal device needs to be reconnected after being disconnected from the network device), the terminal device may first complete downlink synchronization by searching for an SSB, and then obtain a system message. Subsequently, the terminal device may initiate a random access procedure (random access procedure) by sending a random access preamble sequence (preamble), to establish a connection to a cell and achieve uplink synchronization. A resource occupied by the preamble sequence sent by the terminal device belongs to a resource for a random access occasion (RO) configured by the network device.

[0096] Currently, in NR, only PRACH configurations in some frequency bands and systems (for example, the FDD system) are specified in an existing protocol. Because there is a relatively large difference between SSB and RMSI configurations corresponding to different frequency bands or different systems (for example, the FDD system or the TDD system), if the foregoing configuration is directly and simply applied to another frequency band or system, a probability that the resource for the RO collides with a downlink resource (for example, an SSB and/or an RMSI CORESET) may be greatly increased. Consequently, there are a relatively small quantity of valid ROs in a RACH configuration period, and random access efficiency of the terminal device is lowered.

[0097] In view of the foregoing problem, embodiments of this application provide a communication method, to reduce a probability that a resource for an RO collides with a downlink resource (for example, an SSB and/or an RMSI CORESET), increase a quantity of valid ROs in a PRACH configuration period, and improve random access efficiency of a terminal device.

[0098] In other words, the resource for the RO that is configured in the embodiments of this application can avoid an SSB and/or RMSI CORESET resource as much as possible, so that according to the embodiments of this application, a resource collision probability can be reduced, a quantity of valid ROs in the RACH configuration period can be increased, and random access efficiency of the terminal device can be improved.

[0099] For ease of understanding and description, by way of example and not limitation, the following describes an execution process and an execution action in the communication method in a communications system in this application.

[0100] First, to make the method in the embodiments of this application easier to understand, some concepts in the embodiments of this application are described below.

[0101] In the embodiments of this application, one SSB occupies four consecutive orthogonal frequency division multiplexing (Orthogonal Frequency Division Multiplexing, OFDM) symbols. An SSB detection window is a time window that is defined in NR and whose duration is 5 ms. A maximum of L SSBs can be transmitted in the SSB detection window of 5 ms. For different frequency bands, a value of L is as follows:

$L=4$ in a frequency band below 3 GHz;
 $L=8$ or 16 in a frequency band from 3 GHz to 6 GHz; or
 $L=64$ in a frequency band from 6 GHz to 52.6 GHz.

[0102] The SSB supports subcarrier spacings of 15 kHz, 30 kHz, 120 kHz, and 240 kHz. For different subcarrier spacings, in one SSB detection window, mapping patterns configured for SSBs in time domain are different. For each specific mapping pattern, refer to a definition in an existing standard. To avoid repetition, details are not described herein.

[0103] The resource for the RO that is configured in the embodiments of this application need to avoid the SSB and/or RMSI CORESET resource. Therefore, before the embodiments of this application are described, the following first describes, with reference to FIG. 2, three multiplexing patterns (pattern) of SSBs and RMSI CORESETs that are defined in NR based on a current NR protocol.

[0104] As shown in FIG. 2, there are three types of configuration patterns of an SSB and an RMSI CORESET/a PDSCH, namely, a pattern 1 to a pattern 3. In the pattern 1, an SSB and an RMSI CORESET are located at different moments. A transmission bandwidth of the SSB partially overlaps an initial access downlink bandwidth part of the RMSI CORESET. In other words, time division transmission is performed on the SSB and the RMSI CORESET. In the pattern 2, an SSB and an RMSI CORESET are located at different moments. A transmission bandwidth of the SSB does not overlap an initial access downlink bandwidth part including the RMSI CORESET. In other words, frequency division transmission is performed on the SSB and the RMSI CORESET. In the pattern 3, an SSB and an RMSI CORESET are located at a same moment. A transmission bandwidth of the SSB does not overlap an initial access downlink bandwidth part including the RMSI CORESET. In this case, frequency division transmission is also performed on the SSB and the RMSI CORESET.

[0105] Currently, in NR, below 6 GHz, subcarrier spacings corresponding to an SSB and an RMSI CORESET are

15 kHz or 30 kHz. Above 6 GHz, a subcarrier spacing corresponding to an SSB is 120 kHz or 240 kHz, and a subcarrier spacing corresponding to an RMSI CORESET may be 60 kHz or 120 kHz.

[0106] Subcarrier spacing (subcarrier spacing, SCS) combinations for an SSB and an RMSI CORESET that are supported in NR include: {SSB SCS, RMSI CORESET SCS} = {15, 15}, {15, 30}, {30, 15}, {30, 30}, {120, 60}, {120, 120}, {240, 60}, and {240, 120} kHz.

[0107] The SSBs and the RMSI CORESETs in the pattern 2 and the pattern 3 occupy a same slot. Therefore, the SSB and the RMSI CORESET can be avoided provided that a time domain resource for the RO avoids one of the SSB and the RMSI CORESET. In the pattern 1, time domain resources occupied by the SSB and the RMSI CORESET are located at different moments. Therefore, to avoid the SSB and the RMSI CORESET, the time domain resource for the RO need to avoid both the SSB and the RMSI CORESET with respect of the time domain resource. Therefore, a configuration solution for the pattern 1 is more complex than those for the pattern 2 and the pattern 3.

[0108] In the embodiments of this application, a solution for the pattern 1, that is, how to configure a resource for an RO in a TDD system is mainly described below. Solutions for the pattern 2 and the pattern 3 may be obtained by referring to the solution for the pattern 1. Details are not described in the embodiments of this application.

[0109] After a multiplexing pattern of the SSB and the RMSI CORESET is clarified, in the embodiments of this application, a time domain position of the resource for the RO needs to be configured for distribution of SSB and RMSI CORESET resources, to avoid the SSB and RMSI CORESET resources, thereby improving a success rate of sending a preamble sequence on the resource for the RO by the terminal device.

[0110] A preamble sequence in NR is described below.

[0111] Two types of random access preambles are defined in NR:

a first type of random access preambles: four long sequences with a sequence length of 839 and sequence formats 0 to 3; and

a second type of random access preambles: nine short sequences with a sequence length of 139 and sequence formats including A1, A2, A3, B1, B2, B3, B4, C0, and C2.

[0112] Sizes of time domain resources occupied by the foregoing different types of preamble sequences in different formats may be different. For a specific definition of each sequence, refer to descriptions in an existing standard. Details are not described herein.

[0113] In conclusion, it can be learned that NR supports a plurality of subcarrier spacings, flexible TDD semi-static uplink/downlink configurations, flexible and complex time domain configurations of an SSB/RMSI, and a plurality of random access preamble formats. Therefore, a new design needs to be made for a PRACH configuration.

[0114] A specific PRACH configuration method in an embodiment of this application is described below with reference to FIG. 3.

[0115] FIG. 3 is a schematic flowchart of a communication method according to an embodiment of the present invention. The method shown in FIG. 3 may be applied to any one of the foregoing communications systems. The communication method in this embodiment of this application is described from a perspective of a system in FIG. 3. Specifically, the method 300 shown in FIG. 3 includes the following steps.

[0116] 310. A network device sends index indication information, where the index indication information is used to indicate a first configuration index.

[0117] Specifically, the network device first generates the index indication information, and then the network device sends the index indication information to a terminal device. Correspondingly, the terminal device receives the index indication information.

[0118] For example, the network device may send the index indication information by using RMSI. This embodiment of this application is not limited thereto.

[0119] Specifically, a size of the index indication information may be 8 bits, and the first configuration index indicated by the index indication information may be one of a plurality of (for example, less than or equal to 256) configuration indexes.

[0120] It should be understood that, in this embodiment of this application, the configuration index may be a PRACH configuration index (PRACH Configuration Index).

[0121] In this embodiment of this application, the size of the index indication information may correspond to the plurality of configuration indexes. For example, a quantity of the plurality of configuration indexes is less than or equal to 2^n , and the size of the index indication information may be n bits. This embodiment of this application is not limited thereto.

[0122] Optionally, the network device may further send subcarrier spacing indication information to the terminal device. A size of the subcarrier spacing indication information may be 1 bit, and the subcarrier spacing indication information is used to indicate a subcarrier spacing of a PRACH message 1 (preamble). For a frequency band below 6 GHz, a subcarrier spacing of the PRACH message 1 may be 15 kHz or 30 kHz. For a frequency band above 6 GHz, a subcarrier spacing of the PRACH message 1 may be 60 kHz or 120 kHz.

[0123] It should be understood that, in actual application, the network device may combine the index indication information and the subcarrier spacing indication information for sending together by using one piece of signaling, or may separately send the index indication information and the subcarrier spacing indication information. This embodiment of this application is not limited thereto.

[0124] 320. The terminal device determines, based on the first configuration index, first configuration information corresponding to the first configuration index, where the first configuration information is used to indicate a time domain resource for at least one random access preamble occasion RO, and the first configuration information is determined based on a time domain resource for a common signal block and/or time domain information of a control channel resource set.

[0125] In other words, the terminal device may determine the time domain resource for the at least one RO based on the first configuration index.

[0126] It should be understood that, in this embodiment of this application, the time domain information of the control channel resource set may include a time domain offset of the control channel resource set or a time domain position of the control channel resource set. This is not limited in this embodiment to this application.

[0127] Specifically, the terminal device may determine, based on a one-to-one correspondence between a plurality of configuration indexes and a plurality of sets of configuration information, the first configuration information corresponding to the first configuration index, where the first configuration index is one of the plurality of configuration indexes; and after determining the first configuration information, the terminal device may determine the time domain resource for the at least one random access preamble occasion RO based on the configuration information.

[0128] It should be understood that, in this embodiment of this application, both the terminal device and the network device learn of the one-to-one correspondence between a plurality of configuration indexes and a plurality of sets of configuration information in advance. In other words, both the terminal device and the network device prestore the one-to-one correspondence between a plurality of configuration indexes and a plurality of sets of configuration information.

[0129] Specifically, the network device may first determine the time domain resource for the common signal block and/or the time domain information of the control channel resource set, and then the network device may determine the time domain resource for the RO (that is, determine configuration information corresponding to the time domain resource for the RO) based on the time domain resource for the common signal block and/or the time domain information of the control channel resource set. Subsequently, the network device may determine, based on the prestored one-to-one correspondence between a plurality of configuration indexes and a plurality of sets of configuration information, a configuration index corresponding to the time domain resource for the RO. Finally, the network device configures the first configuration index for the terminal device by using the index indication information. Further, the terminal device may determine, in the prestored one-to-one correspondence between a plurality of configuration indexes and a plurality of sets of configuration information based on the first configuration index, the first configuration information corresponding to the first configuration index, and then the terminal device may determine the time domain resource for the at least one RO based on the first configuration information.

[0130] In this embodiment of this application, the time domain resource for the at least one RO is determined based on the time domain resource for the common signal block and/or the time domain information of the control channel resource set. Therefore, the resource for the RO that is configured in this embodiment of this application can avoid an SSB and/or RMSI CORESET resource to the greatest extent, thereby reducing a probability that the resource for the RO collides with a downlink resource (for example, an SSB and/or an RMSI CORESET), increasing a quantity of valid ROs in a PRACH configuration period, and improving random access efficiency of the terminal device.

[0131] It should be understood that, in this embodiment of this application, the common signal block may be an SS/PBCH block, and a control channel resource (set) may be an RMSI CORESET, an OSI CORESET, a control channel resource for a paging (paging) channel, a control channel resource for a random access response, or the like. An example in which the control channel resource is an RMSI CORESET is used below for description, but this embodiment of this application is not limited thereto. The RMSI CORESET may also be referred to as a CORESET of TypeO-PDCCH (the control resource set of the TypeO-PDCCH common search space). Configuration information of the CORESET of TypeO-PDCCH is indicated in a MIB, and may be indicated by using indication information pdccch-ConfigSIB 1 in the MIB. High-order 4 bits and low-order 4 bits of the indication information jointly indicate a time-frequency resource position (for example, several consecutive RBs and several consecutive symbols) of the CORESET of TypeO-PDCCH. TypeO-PDCCH may be used to transmit scheduling information of a SIB 1 (which may also be referred to as RMSI).

[0132] Specifically, in this embodiment of this application, as shown in Table 1, there may be the following correspondences between configuration indexes and configuration information:

Table 1

Configuration index	Configuration information
0	Configuration information 0

(continued)

Configuration index	Configuration information
1	Configuration information 1
2	Configuration information 2
...	...

[0133] It can be learned from Table 1 that, there is a one-to-one correspondence between configuration indexes and configuration information. In actual application, after determining the configuration index, the terminal device may query Table 1 to obtain the configuration information corresponding to the configuration index, to determine the time domain resource for the RO.

[0134] It should be understood that, in this embodiment of this application, each set of configuration information may include at least one of the following information:

first indication information used to indicate a first time unit in a random access configuration period;
 second indication information used to indicate at least one second time unit in the first time unit;
 third indication information used to indicate a quantity of third time units included in each of the at least one second time unit;
 fourth indication information used to indicate a quantity of ROs in the third time unit; and
 fifth indication information used to indicate a starting time domain position of an RO in the third time unit.

[0135] Optionally, in an embodiment, the first time unit is a system frame; the second time unit is a subframe or is of 0.25 ms; and the third time unit is a slot.

[0136] Optionally, in an embodiment, the starting time domain position of the RO indicates a position, in the third time unit, of the first fourth time unit in at least one fourth time unit that is in the third time unit and that is occupied by the RO.

[0137] It should be understood that, the first fourth time unit may alternatively be the first fourth time unit occupied by the first RO in at least one RO in the third time unit.

[0138] Optionally, in an embodiment, the fourth time unit may be an OFDM symbol.

[0139] A person skilled in the art may clearly understand that various numbers such as "first" and "second" in this application are for distinguishing only for ease of description, and are not intended to limit this embodiment of this application.

[0140] It should be understood that, a slot (slot) in the present invention may alternatively be a TTI and/or a time unit and/or a subframe and/or a mini-slot and/or the like. This embodiment of this application is not limited thereto.

[0141] Specifically, the terminal device determines, based on the first indication information, a sequence number of the first time unit in the configuration period (or a sequence number corresponding to a position of the first time unit in the configuration period), determines, based on the second indication information, a time domain position or a time domain sequence number of the second time unit in the first time unit (namely, the first time unit indicated by the first indication information), determines, based on the third indication information, the quantity of third time units in the second time unit, and finally determines, based on the fourth indication information and the fifth indication information, a time domain resource for the RO in each third time unit. It should be understood that, the time domain resource for the RO in the third time unit may include a sequence number of a starting fourth time unit (such as a symbol) of the RO in the third time unit and the quantity of ROs.

[0142] For example, the terminal device determines, based on the first indication information, a sequence number, in one configuration period, of a first time unit (a system frame) in which a time domain resource for at least one RO in the configuration period is located; determines, based on the second indication information, a sequence number of a subframe (1 ms) in the system frame (which may also be referred to as an index of a slot corresponding to a subcarrier of 15 kHz in a current system frame) or a specific time unit of 0.25 ms (which may also be referred to as an index of a slot corresponding to a subcarrier of 60 kHz in a current system frame); and then determines a quantity of slots in the subframe or 0.25 ms, and determine a starting symbol in the subframe or 0.25 ms and a quantity of ROs in each slot.

[0143] In other words, the time domain resource for the at least one RO includes resources in a plurality of slots, namely, time domain resources for a plurality of consecutive ROs starting from a starting symbol in each of the plurality of slots.

[0144] It should be noted that a name "configuration period" in this embodiment of this application is equivalent to a "PRACH period", and a name "symbol" is equivalent to an "OFDM symbol".

[0145] It should be understood that, in this embodiment of this application, the one-to-one correspondence between a plurality of configuration indexes and a plurality of sets of configuration information may be in a form of a table, for

example, a PRACH configuration table. Optionally, the one-to-one correspondence between a plurality of configuration indexes and a plurality of sets of configuration information may alternatively be a group of symbols, a string of bit data, or the like. This embodiment of this application is not limited thereto.

[0146] For example, the PRACH configuration table may be a short preamble sequence configuration table below 6 GHz in TDD or a short preamble sequence configuration table above 6 GHz in TDD.

[0147] The short preamble sequence PRACH configuration table below 6 GHz in TDD is described below with reference to Table 2 and Table 3. Table 2 corresponds to Table 3. Both Table 2 and Table 3 are short preamble sequence PRACH configuration tables below 6 GHz. Table 2 and Table 3 respectively correspond to different solutions for configuring time domain resources for the RO. For details, refer to the following descriptions.

[0148] The short preamble sequence PRACH configuration table above 6 GHz in TDD is described in detail with reference to Table 4 and Table 5. Table 4 corresponds to Table 5. Both Table 4 and Table 5 are short preamble sequence PRACH configuration tables above 6 GHz. Table 4 and Table 5 respectively correspond to different solutions for configuring time domain resources for the RO. For details, refer to the following descriptions.

Table 2

PRACH Config. Index	Preamble format	SFNmod x = y		subframe number (1 ms)	Starting symbol	Number of PRACH slots within a subframe	Number of ROs within a RACH slot
		x	y				
71	A1	1	0	9	0	2	6
72	A1	1	0	4	0	2	6
73	A1	1	0	8	0	2	6
74	A1	1	0	3	0	2	6
75	A1	1	0	4, 9	0	1	6
76	A1	1	0	3, 8	0	2	6
77	A1	1	0	2, 7	0	1	6
78	A1	1	0	4, 8, 9	0	2	6
79	A1	1	0	3, 4, 8, 9	0	2	6
80	A1	1	0	1, 3, 5, 7, 9	0	2	6
81	A1	2	1	4, 9	0	1	6
82	A1	2	1	3, 8	0	1	6
83	A1	2	1	4	0	2	6
84	A1	2	1	9	0	2	6
85	A1	2	1	8	0	2	6
86	A1	4	1	9	0	2	6
87	A1	4	1	4, 9	0	1	6
88	A1	8	1	9	0	2	6
89	A1	8	1	4, 9	0	1	6
90	A1	16	1	9	0	2	6
91	A1	16	1	4, 9	0	1	6
92	B1	1	0	9	0	2	7
93	B1	1	0	4	0	2	7
94	B1	1	0	8	0	2	7
95	B1	1	0	3	0	2	7
96	B1	1	0	4, 9	0	1	7
97	B1	1	0	3, 8	0	2	7

EP 3 742 848 A1

(continued)

5	PRACH Config. Index	Preamble format	SFNmod x = y		subframe number (1 ms)	Starting symbol	Number of PRACH slots within a subframe	Number of ROs within a RACH slot
			x	y				
10	98	B1	1	0	2, 7	0	1	7
	99	B1	1	0	4, 8, 9	0	2	7
	100	B1	1	0	3, 4, 8, 9	0	2	7
15	101	B1	1	0	1, 3, 5, 7, 9	0	2	7
	102	B1	2	1	4, 9	0	1	7
	103	B1	2	1	3, 8	0	1	7
20	104	B1	2	1	4	0	2	7
	105	B1	2	1	9	0	2	7
	106	B1	2	1	8	0	2	7
25	107	B1	4	1	9	0	2	7
	108	B1	4	1	4, 9	0	1	7
	109	B1	8	1	9	0	2	7
30	110	B1	8	1	4, 9	0	1	7
	111	B1	16	1	9	0	2	7
	112	B1	16	1	4, 9	0	1	7
35	113	A2	1	0	9	0	2	3
	114	A2	1	0	4	0	2	3
	115	A2	1	0	8	0	2	3
40	116	A2	1	0	3	0	2	3
	117	A2	1	0	4, 9	0	1	3
	118	A2	1	0	3, 8	0	2	3
45	119	A2	1	0	2, 7	0	1	3
	120	A2	1	0	4, 8, 9	0	2	3
	121	A2	1	0	3, 4, 8, 9	0	2	3
50	122	A2	1	0	1, 3, 5, 7, 9	0	2	3
	123	A2	2	1	4, 8, 9	0	1	3
	124	A2	2	1	4, 9	0	1	3
55	125	A2	2	1	4	0	2	3
	126	A2	2	1	9	0	2	3
	127	A2	2	1	8	0	2	3
60	128	A2	4	1	9	0	2	3
	129	A2	4	1	4, 8, 9	0	1	3
	130	A2	8	1	9	0	2	3
65	131	A2	8	1	4, 8, 9	0	1	3
	132	A2	16	1	9	0	2	3
	133	A2	16	1	4, 8, 9	0	1	3

EP 3 742 848 A1

(continued)

5	PRACH Config. Index	Preamble format	SFNmod x = y		subframe number (1 ms)	Starting symbol	Number of PRACH slots within a subframe	Number of ROs within a RACH slot
			x	y				
10	134	A3	1	0	9	0	2	2
	135	A3	1	0	4	0	2	2
	136	A3	1	0	8	0	2	2
	137	A3	1	0	3	0	2	2
	138	A3	1	0	4, 9	0	1	2
15	139	A3	1	0	3, 8	0	2	2
	140	A3	1	0	2, 7	0	1	2
	141	A3	1	0	4, 8, 9	0	2	2
	142	A3	1	0	3, 4, 8, 9	0	2	2
	143	A3	1	0	1, 3, 5, 7, 9	0	2	2
20	144	A3	2	1	4, 8, 9	0	1	2
	145	A3	2	1	4, 9	0	1	2
	146	A3	2	1	4	0	2	2
	147	A3	2	1	9	0	2	2
	148	A3	2	1	8	0	2	2
25	149	A3	4	1	9	0	2	2
	150	A3	4	1	4, 9	0	1	2
	151	A3	8	1	9	0	2	2
	152	A3	8	1	4, 9	0	1	2
	153	A3	16	1	9	0	2	2
30	154	A3	16	1	4, 9	0	1	2
	155	B4	1	0	9	0	2	1
	156	B4	1	0	4	0	2	1
	157	B4	1	0	8	0	2	1
	158	B4	1	0	3	0	2	1
35	159	B4	1	0	4, 9	0	1	1
	160	B4	1	0	3, 8	0	2	1
	161	B4	1	0	2, 7	0	1	1
	162	B4	1	0	4, 8, 9	0	2	1
	163	B4	1	0	3, 4, 8, 9	0	2	1
40	164	B4	1	0	1, 3, 5, 7, 9	0	2	1
	165	B4	2	1	4, 9	0	1	1
	166	B4	2	1	3, 8	0	1	1
	167	B4	2	1	4	0	2	1
	168	B4	2	1	9	0	2	1
55	169	B4	2	1	8	0	2	1

EP 3 742 848 A1

(continued)

5	PRACH Config. Index	Preamble format	SFNmod x = y		subframe number (1 ms)	Starting symbol	Number of PRACH slots within a subframe	Number of ROs within a RACH slot
			x	y				
10	170	B4	4	1	9	0	2	1
	171	B4	4	1	4, 9	0	1	1
	172	B4	8	1	9	0	2	1
	173	B4	8	1	4, 9	0	1	1
	174	B4	16	1	9	0	2	1
15	175	B4	16	1	4, 9	0	1	1
	176	C0	1	0	9	0	2	7
	177	C0	1	0	4	0	2	7
	178	C0	1	0	8	0	2	7
	179	C0	1	0	3	0	2	7
20	180	C0	1	0	4, 9	0	1	7
	181	C0	1	0	3, 8	0	2	7
	182	C0	1	0	2, 7	0	1	7
	183	C0	1	0	4, 8, 9	0	2	7
	184	C0	1	0	3, 4, 8, 9	0	2	7
25	185	C0	1	0	1, 3, 5, 7, 9	0	2	7
	186	C0	2	1	4, 9	0	1	7
	187	C0	2	1	3, 8	0	1	7
	188	C0	2	1	4	0	2	7
	189	C0	2	1	9	0	2	7
30	190	C0	2	1	8	0	2	7
	191	C0	4	1	9	0	2	7
	192	C0	4	1	4, 9	0	1	7
	193	C0	8	1	9	0	2	7
	194	C0	8	1	4, 9	0	1	7
35	195	C2	1	0	9	0	2	2
	196	C2	1	0	4	0	2	2
	197	C2	1	0	8	0	2	2
	198	C2	1	0	3	0	2	2
	199	C2	1	0	4, 9	0	1	2
40	200	C2	1	0	3, 8	0	2	2
	201	C2	1	0	2, 7	0	1	2
	202	C2	1	0	4, 8, 9	0	2	2
	203	C2	1	0	3, 4, 8, 9	0	2	2
	204	C2	1	0	1, 3, 5, 7, 9	0	2	2
55	205	C2	2	1	4, 8, 9	0	1	2

EP 3 742 848 A1

(continued)

5	PRACH Config. Index	Preamble format	SFNmod x = y		subframe number (1 ms)	Starting symbol	Number of PRACH slots within a subframe	Number of ROs within a RACH slot
			x	y				
10	206	C2	2	1	4, 9	0	1	2
	207	C2	2	1	4	0	2	2
	208	C2	2	1	9	0	2	2
	209	C2	2	1	8	0	2	2
	210	C2	4	1	9	0	2	2
15	211	C2	4	1	4, 8, 9	0	1	2
	212	C2	8	1	9	0	2	2
	213	C2	8	1	4, 8, 9	0	1	2
	214	C2	16	1	9	0	2	2
	215	C2	16	1	4, 8, 9	0	1	2
20	216	A1/B1	1	0	9	0	2	7
	217	A1/B1	1	0	4	0	2	7
	218	A1/B1	1	0	8	0	2	7
	219	A1/B1	1	0	3	0	2	7
	220	A1/B1	1	0	4, 9	0	1	7
25	221	A1/B1	1	0	3, 8	0	2	7
	222	A1/B1	1	0	2, 7	0	1	7
	223	A1/B1	1	0	4, 8, 9	0	2	7
	224	A1/B1	1	0	3, 4, 8, 9	0	2	7
	225	A1/B1	1	0	1, 3, 5, 7, 9	0	2	7
30	226	A1/B1	2	1	4, 9	0	1	7
	227	A1/B1	2	1	9	0	2	7
	228	A2/B2	1	0	9	0	2	3
	229	A2/B2	1	0	4	0	2	3
	230	A2/B2	1	0	8	0	2	3
35	231	A2/B2	1	0	3	0	2	3
	232	A2/B2	1	0	4, 9	0	1	3
	233	A2/B2	1	0	3, 8	0	2	3
	234	A2/B2	1	0	2, 7	0	1	3
	235	A2/B2	1	0	4, 8, 9	0	2	3
40	236	A2/B2	1	0	3, 4, 8, 9	0	2	3
	237	A2/B2	1	0	1, 3, 5, 7, 9	0	2	3
	238	A2/B2	2	1	4, 8, 9	0	1	3
	239	A2/B2	2	1	4, 9	0	1	3
	240	A2/B2	2	1	4	0	2	3
55	241	A2/B2	2	1	9	0	2	3

(continued)

PRACH Config. Index	Preamble format	SFNmod x = y		subframe number (1 ms)	Starting symbol	Number of PRACH slots within a subframe	Number of ROs within a RACH slot
		x	y				
242	A3/B3	1	0	9	0	2	2
243	A3/B3	1	0	4	0	2	2
244	A3/B3	1	0	8	0	2	2
245	A3/B3	1	0	3	0	2	2
246	A3/B3	1	0	4, 9	0	1	2
247	A3/B3	1	0	3, 8	0	2	2
248	A3/B3	1	0	2, 7	0	1	2
249	A3/B3	1	0	4, 8, 9	0	2	2
250	A3/B3	1	0	3, 4, 8, 9	0	2	2
251	A3/B3	1	0	1, 3, 5, 7, 9	0	2	2
252	A3/B3	2	1	4, 8, 9	0	1	2
253	A3/B3	2	1	4, 9	0	1	2
254	A3/B3	2	1	4	0	2	2
255	A3/B3	2	1	9	0	2	2

Table 3

PRACH Config. Index	Preamble format	SFNmod x = y		subframe number (1 ms)	Starting symbol (Ns)	Number of PRACH slots within a subframe	Number of ROs within a RACH slot
		x	y				
71	A1	1	0	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$
72	A1	1	0	4	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$
73	A1	1	0	8	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$
74	A1	1	0	3	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$
75	A1	1	0	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/2]$
76	A1	1	0	3, 8	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$
77	A1	1	0	2, 7	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/2]$
78	A1	1	0	4, 8, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$
79	A1	1	0	3, 4, 8, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$
80	A1	1	0	1, 3, 5, 7, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFNmod x = y		subframe number (1 ms)	Starting symbol (Ns)	Number of PRACH slots within a subframe	Number of ROs within a RACH slot
		x	y				
5 81	A1	2	1	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/2]$
10 82	A1	2	1	3, 8	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/2]$
15 83	A1	2	1	4	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$
15 84	A1	2	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$
20 85	A1	2	1	8	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$
20 86	A1	4	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$
25 87	A1	4	1	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/2]$
25 88	A1	8	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$
25 89	A1	8	1	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/2]$
30 90	A1	16	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$
30 91	A1	16	1	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/2]$
35 92	B1	1	0	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
35 93	B1	1	0	4	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
40 94	B1	1	0	8	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
40 95	B1	1	0	3	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
45 96	B1	1	0	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/2]$
45 97	B1	1	0	3, 8	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
50 98	B1	1	0	2, 7	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/2]$
50 99	B1	1	0	4, 8, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
55 100	B1	1	0	3, 4, 8, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
55 101	B1	1	0	1, 3, 5, 7, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$

(continued)

5	PRACH Config. Index	Preamble format	SFNmod x = y		subframe number (1 ms)	Starting symbol (Ns)	Number of PRACH slots within a subframe	Number of ROs within a RACH slot
			x	y				
	102	B1	2	1	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/2]$
10	103	B1	2	1	3, 8	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/2]$
	104	B1	2	1	4	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
15	105	B1	2	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
	106	B1	2	1	8	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
20	107	B1	4	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
	108	B1	4	1	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/2]$
25	109	B1	8	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
	110	B1	8	1	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/2]$
30	111	B1	16	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
	112	B1	16	1	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/2]$
35	113	A2	1	0	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
	114	A2	1	0	4	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
40	115	A2	1	0	8	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
	116	A2	1	0	3	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
45	117	A2	1	0	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/4]$
	118	A2	1	0	3, 8	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
50	119	A2	1	0	2, 7	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/4]$
	120	A2	1	0	4, 8, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
55	121	A2	1	0	3, 4, 8, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
	122	A2	1	0	1, 3, 5, 7, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$

EP 3 742 848 A1

(continued)

5	PRACH Config. Index	Preamble format	SFNmod x = y		subframe number (1 ms)	Starting symbol (Ns)	Number of PRACH slots within a subframe	Number of ROs within a RACH slot
			x	y				
	123	A2	2	1	4, 8, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/4]$
10	124	A2	2	1	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/4]$
	125	A2	2	1	4	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
15	126	A2	2	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
	127	A2	2	1	8	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
20	128	A2	4	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
	129	A2	4	1	4, 8, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/4]$
25	130	A2	8	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
	131	A2	8	1	4, 8, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/4]$
30	132	A2	16	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
	133	A2	16	1	4, 8, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/4]$
35	134	A3	1	0	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/6]$
	135	A3	1	0	4	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/6]$
40	136	A3	1	0	8	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/6]$
	137	A3	1	0	3	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/6]$
45	138	A3	1	0	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/6]$
	139	A3	1	0	3, 8	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/6]$
50	140	A3	1	0	2, 7	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/6]$
	141	A3	1	0	4, 8, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/6]$
55	142	A3	1	0	3, 4, 8, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/6]$
	143	A3	1	0	1, 3, 5, 7, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/6]$

EP 3 742 848 A1

(continued)

5	PRACH Config. Index	Preamble format	SFNmod x = y		subframe number (1 ms)	Starting symbol (Ns)	Number of PRACH slots within a subframe	Number of ROs within a RACH slot
			x	y				
	144	A3	2	1	4, 8, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/6]$
10	145	A3	2	1	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/6]$
	146	A3	2	1	4	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/6]$
15	147	A3	2	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/6]$
	148	A3	2	1	8	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/6]$
20	149	A3	4	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/6]$
	150	A3	4	1	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/6]$
25	151	A3	8	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/6]$
	152	A3	8	1	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/6]$
30	153	A3	16	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/6]$
	154	A3	16	1	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/6]$
35	155	B4	1	0	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$
	156	B4	1	0	4	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$
40	157	B4	1	0	8	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$
	158	B4	1	0	3	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$
45	159	B4	1	0	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/12]$
	160	B4	1	0	3, 8	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$
50	161	B4	1	0	2, 7	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/12]$
	162	B4	1	0	4, 8, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$
55	163	B4	1	0	3, 4, 8, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$
	164	B4	1	0	1, 3, 5, 7, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$

(continued)

5	PRACH Config. Index	Preamble format	SFNmod x = y		subframe number (1 ms)	Starting symbol (Ns)	Number of PRACH slots within a subframe	Number of ROs within a RACH slot
			x	y				
	165	B4	2	1	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/12]$
10	166	B4	2	1	3, 8	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/12]$
	167	B4	2	1	4	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$
15	168	B4	2	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$
	169	B4	2	1	8	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$
20	170	B4	4	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$
	171	B4	4	1	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/12]$
25	172	B4	8	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$
	173	B4	8	1	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/12]$
30	174	B4	16	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$
	175	B4	16	1	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/12]$
35	176	C0	1	0	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)]$
	177	C0	1	0	4	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)]$
40	178	C0	1	0	8	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)]$
	179	C0	1	0	3	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)]$
45	180	C0	1	0	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)]$
	181	C0	1	0	3, 8	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)]$
50	182	C0	1	0	2, 7	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)]$
	183	C0	1	0	4, 8, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)]$
55	184	C0	1	0	3, 4, 8, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)]$
	185	C0	1	0	1, 3, 5, 7, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)]$

EP 3 742 848 A1

(continued)

5	PRACH Config. Index	Preamble format	SFNmod x = y		subframe number (1 ms)	Starting symbol (Ns)	Number of PRACH slots within a subframe	Number of ROs within a RACH slot
			x	y				
	186	C0	2	1	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)]$
10	187	C0	2	1	3, 8	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)]$
	188	C0	2	1	4	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)]$
15	189	C0	2	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)]$
	190	C0	2	1	8	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)]$
20	191	C0	4	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)]$
	192	C0	4	1	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)]$
25	193	C0	8	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)]$
	194	C0	8	1	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)]$
30	195	C2	1	0	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
	196	C2	1	0	4	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
35	197	C2	1	0	8	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
	198	C2	1	0	3	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
40	199	C2	1	0	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/4]$
	200	C2	1	0	3, 8	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
45	201	C2	1	0	2, 7	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/4]$
	202	C2	1	0	4, 8, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
50	203	C2	1	0	3, 4, 8, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
	204	C2	1	0	1, 3, 5, 7, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
55	205	C2	2	1	4, 8, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/4]$
	206	C2	2	1	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/4]$

EP 3 742 848 A1

(continued)

5	PRACH Config. Index	Preamble format	SFNmod x = y		subframe number (1 ms)	Starting symbol (Ns)	Number of PRACH slots within a subframe	Number of ROs within a RACH slot
			x	y				
	207	C2	2	1	4	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
10	208	C2	2	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
	209	C2	2	1	8	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
15	210	C2	4	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
	211	C2	4	1	4, 8, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/4]$
20	212	C2	8	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
	213	C2	8	1	4, 8, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/4]$
25	214	C2	16	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
	215	C2	16	1	4, 8, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/4]$
30	216	A1/B1	1	0	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
	217	A1/B1	1	0	4	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
35	218	A1/B1	1	0	8	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
	219	A1/B1	1	0	3	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
40	220	A1/B1	1	0	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/2]$
	221	A1/B1	1	0	3, 8	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
45	222	A1/B1	1	0	2, 7	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/2]$
	223	A1/B1	1	0	4, 8, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
50	224	A1/B1	1	0	3, 4, 8, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
	225	A1/B1	1	0	1, 3, 5, 7, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
55	226	A1/B1	2	1	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/2]$
	227	A1/B1	2	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$

(continued)

5	PRACH Config. Index	Preamble format	SFNmod x = y		subframe number (1 ms)	Starting symbol (Ns)	Number of PRACH slots within a subframe	Number of ROs within a RACH slot
			x	y				
	228	A2/B2	1	0	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/4]$
10	229	A2/B2	1	0	4	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/4]$
	230	A2/B2	1	0	8	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/4]$
15	231	A2/B2	1	0	3	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/4]$
	232	A2/B2	1	0	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/4]$
20	233	A2/B2	1	0	3, 8	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/4]$
	234	A2/B2	1	0	2, 7	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/4]$
25	235	A2/B2	1	0	4, 8, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/4]$
	236	A2/B2	1	0	3, 4, 8, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/4]$
30	237	A2/B2	1	0	1, 3, 5, 7, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/4]$
	238	A2/B2	2	1	4, 8, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/4]$
35	239	A2/B2	2	1	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/4]$
	240	A2/B2	2	1	4	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/4]$
40	241	A2/B2	2	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/4]$
	242	A3/B3	1	0	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/6]$
45	243	A3/B3	1	0	4	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/6]$
	244	A3/B3	1	0	8	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/6]$
50	245	A3/B3	1	0	3	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/6]$
	246	A3/B3	1	0	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/6]$
55	247	A3/B3	1	0	3, 8	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/6]$
	248	A3/B3	1	0	2, 7	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/6]$

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		subframe number (1 ms)	Starting symbol (Ns)	Number of PRACH slots within a subframe	Number of ROs within a RACH slot
		x	y				
249	A3/B3	1	0	4, 8, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/6]$
250	A3/B3	1	0	3, 4, 8, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/6]$
251	A3/B3	1	0	1, 3, 5, 7, 9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/6]$
252	A3/B3	2	1	4, 8, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/6]$
253	A3/B3	2	1	4, 9	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/6]$
254	A3/B3	2	1	4	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/6]$
255	A3/B3	2	1	9	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/6]$

Table 4

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
0	A1	1	0	case A: 9 case B: 39	0	2	6
1	A1	1	0	case A: 9 case B: 29	0	2	6
2	A1	1	0	case A: 4, 9 case B: 29, 39	0	1	6
3	A1	1	0	case A: 4, 9, 19 case B: 29, 34, 39	0	1	6
4	A1	1	0	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	0	1	6
5	A1	1	0	case A: 16, 17, 18, 19 case B: 33, 35, 37, 39	0	2	6
6	A1	1	0	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	0	2	6
7	A1	1	0	case A: 9, 11, 13, 15, 17, 19 case B: 29, 31, 33, 35, 37, 39	0	2	6
8	A1	1	0	case A: 4, 9, 14, 19, 24, 29 case B: 14, 19, 24, 29, 34, 39	0	1	6
9	A1	1	0	4, 9, 14, 19, 24, 29, 34, 39	0	1	6

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
10	A1	1	0	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	6
11	A1	1	0	case A: 12, 13, 14, 15, 16, 17, 18, 19 case B: 32, 33, 34, 35, 36, 37, 38, 39	0	2	6
12	A1	1	0	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	6
13	A1	1	0	4, 9, 11, 13, 15, 17, 19, 24, 29, 31, 33, 35, 37, 39	0	2	6
14	A1	1	0	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	0	2	6
15	A1	1	0	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	6
16	A1	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9 case B: 29, 39	0	2	6
17	A1	2	$O \geq 5:0$ $O < 5:1$	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	0	2	6
18	A1	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	0	1	6
19	A1	2	$O \geq 5:0$ $O < 5:1$	4, 9, 14, 19, 24, 29, 34, 39	0	1	6
20	A1	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	6
21	A1	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	6
22	A1	2	$O \geq 5:0$ $O < 5:1$	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	0	2	6
23	A1	2	$O \geq 5:0$ $O < 5:1$	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	6

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
24	A1	4	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	6
25	A1	4	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	6
26	A1	8	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	6
27	A1	8	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	6
28	A1	16	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	6
29	A1	16	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	6
30	A2	1	0	case A: 9 case B: 39	0	2	3
31	A2	1	0	case A: 9 case B: 29	0	2	3
32	A2	1	0	case A: 4, 9 case B: 29, 39	0	1	3
33	A2	1	0	case A: 4, 9, 19 case B: 29, 34, 39	0	1	3
34	A2	1	0	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	0	1	3
35	A2	1	0	case A: 16, 17, 18, 19 case B: 33, 35, 37, 39	0	2	3
36	A2	1	0	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	0	2	3
37	A2	1	0	case A: 9, 11, 13, 15, 17, 19 case B: 29, 31, 33, 35, 37, 39	0	2	3

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
38	A2	1	0	case A: 4, 9, 14, 19, 24, 29 case B: 14, 19, 24, 29, 34, 39	0	1	3
39	A2	1	0	4, 9, 14, 19, 24, 29, 34, 39	0	1	3
40	A2	1	0	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	3
41	A2	1	0	case A: 12, 13, 14, 15, 16, 17, 18, 19 case B: 32, 33, 34, 35, 36, 37, 38, 39	0	2	3
42	A2	1	0	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	3
43	A2	1	0	4, 9, 11, 13, 15, 17, 19, 24, 29, 31, 33, 35, 37, 39	0	2	3
44	A2	1	0	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	0	2	3
45	A2	1	0	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	3
46	A2	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9 case B: 29, 39	0	2	3
47	A2	2	$O \geq 5:0$ $O < 5:1$	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	0	2	3
48	A2	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	0	1	3
49	A2	2	$O \geq 5:0$ $O < 5:1$	4, 9, 14, 19, 24, 29, 34, 39	0	1	3
50	A2	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	3
51	A2	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	3
52	A2	2	$O \geq 5:0$ $O < 5:1$	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	0	2	3

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
53	A2	2	$O \geq 5:0$ $O < 5:1$	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	3
54	A2	4	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	3
55	A2	4	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	3
56	A2	8	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	3
57	A2	8	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	3
58	A2	16	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	3
59	A2	16	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	3
60	A3	1	0	case A: 9 case B: 39	0	2	2
61	A3	1	0	case A: 9 case B: 29	0	2	2
62	A3	1	0	case A: 4, 9 case B: 29, 39	0	1	2
63	A3	1	0	case A: 4, 9, 19 case B: 29, 34, 39	0	1	2
64	A3	1	0	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	0	1	2
65	A3	1	0	case A: 16, 17, 18, 19 case B: 33, 35, 37, 39	0	2	2
66	A3	1	0	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	0	2	2

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
67	A3	1	0	case A: 9, 11, 13, 15, 17, 19 case B: 29, 31, 33, 35, 37, 39	0	2	2
68	A3	1	0	case A: 4, 9, 14, 19, 24, 29 case B: 14, 19, 24, 29, 34, 39	0	1	2
69	A3	1	0	4, 9, 14, 19, 24, 29, 34, 39	0	1	2
70	A3	1	0	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	2
71	A3	1	0	case A: 12, 13, 14, 15, 16, 17, 18, 19 case B: 32, 33, 34, 35, 36, 37, 38, 39	0	2	2
72	A3	1	0	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	2
73	A3	1	0	4, 9, 11, 13, 15, 17, 19, 24, 29, 31, 33, 35, 37, 39	0	2	2
74	A3	1	0	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	0	2	2
75	A3	1	0	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	2
76	A3	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9 case B: 29, 39	0	2	2
77	A3	2	$O \geq 5:0$ $O < 5:1$	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	0	2	2
78	A3	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	0	1	2
79	A3	2	$O \geq 5:0$ $O < 5:1$	4, 9, 14, 19, 24, 29, 34, 39	0	1	2
80	A3	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	2

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
81	A3	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	2
82	A3	2	$O \geq 5:0$ $O < 5:1$	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	0	2	2
83	A3	2	$O \geq 5:0$ $O < 5:1$	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	2
84	A3	4	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	2
85	A3	4	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	2
86	A3	8	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	2
87	A3	8	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	2
88	A3	16	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	2
89	A3	16	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	2
90	B1	1	0	case A: 9 case B: 39	0	2	7
91	B1	1	0	case A: 9 case B: 29	0	2	7
92	B1	1	0	case A: 4, 9 case B: 29, 39	0	1	7
93	B1	1	0	case A: 4, 9, 19 case B: 29, 34, 39	0	1	7

EP 3 742 848 A1

(continued)

5	PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
			x	y				
	94	B1	1	0	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	0	1	7
10	95	B1	1	0	case A: 16, 17, 18, 19 case B: 33, 35, 37, 39	0	2	7
	96	B1	1	0	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	0	2	7
15	97	B1	1	0	case A: 9, 11, 13, 15, 17, 19 case B: 29, 31, 33, 35, 37, 39	0	2	7
20	98	B1	1	0	case A: 4, 9, 14, 19, 24, 29 case B: 14, 19, 24, 29, 34, 39	0	1	7
	99	B1	1	0	4, 9, 14, 19, 24, 29, 34, 39	0	1	7
25	100	B1	1	0	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	7
30	101	B1	1	0	case A: 12, 13, 14, 15, 16, 17, 18, 19	0	2	7
					case B: 32, 33, 34, 35, 36, 37, 38, 39			
35	102	B1	1	0	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	7
40	103	B1	1	0	4, 9, 11, 13, 15, 17, 19, 24, 29, 31, 33, 35, 37, 39	0	2	7
	104	B1	1	0	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	0	2	7
45	105	B1	1	0	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	7
50	106	B1	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9 case B: 29, 39	0	2	7
	107	B1	2	$O \geq 5:0$ $O < 5:1$	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	0	2	7
55	108	B1	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	0	1	7
	109	B1	2	$O \geq 5:0$ $O < 5:1$	4, 9, 14, 19, 24, 29, 34, 39	0	1	7

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
110	B1	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	7
111	B1	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	7
112	B1	2	$O \geq 5:0$ $O < 5:1$	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	0	2	7
113	B1	2	$O \geq 5:0$ $O < 5:1$	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	7
114	B1	4	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	7
115	B1	4	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	7
116	B1	8	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	7
117	B1	8	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	7
118	B1	16	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	7
119	B1	16	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	7
120	B4	1	0	case A: 9 case B: 39	0	2	1
121	B4	1	0	case A: 9 case B: 29	0	2	1
122	B4	1	0	case A: 4, 9 case B: 29, 39	0	1	1

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
123	B4	1	0	case A: 4, 9, 19 case B: 29, 34, 39	0	1	1
124	B4	1	0	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	0	1	1
125	B4	1	0	case A: 16, 17, 18, 19 case B: 33, 35, 37, 39	0	2	1
126	B4	1	0	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	0	2	1
127	B4	1	0	case A: 9, 11, 13, 15, 17, 19 case B: 29, 31, 33, 35, 37, 39	0	2	1
128	B4	1	0	case A: 4, 9, 14, 19, 24, 29 case B: 14, 19, 24, 29, 34, 39	0	1	1
129	B4	1	0	4, 9, 14, 19, 24, 29, 34, 39	0	1	1
130	B4	1	0	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	1
131	B4	1	0	case A: 12, 13, 14, 15, 16, 17, 18, 19 case B: 32, 33, 34, 35, 36, 37, 38, 39	0	2	1
132	B4	1	0	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	1
133	B4	1	0	4, 9, 11, 13, 15, 17, 19, 24, 29, 31, 33, 35, 37, 39	0	2	1
134	B4	1	0	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	0	2	1
135	B4	1	0	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24,	0	2	1
				29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39			
136	B4	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9 case B: 29, 39	0	2	1
137	B4	2	$O \geq 5:0$ $O < 5:1$	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	0	2	1
138	B4	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	0	1	1

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
139	B4	2	$O \geq 5:0$ $O < 5:1$	4, 9, 14, 19, 24, 29, 34, 39	0	1	1
140	B4	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	1
141	B4	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	1
142	B4	2	$O \geq 5:0$ $O < 5:1$	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	0	2	1
143	B4	2	$O \geq 5:0$ $O < 5:1$	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	1
144	B4	4	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	1
145	B4	4	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	1
146	B4	8	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	1
147	B4	8	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	1
148	B4	16	$O \geq 5:$	case A: 4, 9,	0	2	1
			$O < 5:1$	11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39			
149	B4	16	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	1
150	C0	1	0	case A: 9 case B: 39	0	2	7

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
151	C0	1	0	case A: 9 case B: 29	0	2	7
152	C0	1	0	case A: 4, 9 case B: 29, 39	0	2	7
153	C0	1	0	case A: 4, 9, 19 case B: 29, 34, 39	0	1	7
154	C0	1	0	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	0	1	7
155	C0	1	0	case A: 16, 17, 18, 19 case B: 33, 35, 37, 39	0	2	7
156	C0	1	0	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	0	2	7
157	C0	1	0	case A: 9, 11, 13, 15, 17, 19 case B: 29, 31, 33, 35, 37, 39	0	2	7
158	C0	1	0	case A: 4, 9, 14, 19, 24, 29 case B: 14, 19, 24, 29, 34, 39	0	1	7
159	C0	1	0	4, 9, 14, 19, 24, 29, 34, 39	0	1	7
160	C0	1	0	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	7
161	C0	1	0	case A: 12, 13, 14, 15, 16, 17, 18, 19 case B: 32, 33, 34, 35, 36, 37, 38, 39	0	2	7
162	C0	1	0	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	7
163	C0	1	0	4, 9, 11, 13, 15, 17, 19, 24, 29, 31, 33, 35, 37, 39	0	2	7
164	C0	1	0	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	0	2	7
165	C0	1	0	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	7

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
166	C0	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9 case B: 29, 39	0	2	7
167	C0	2	$O \geq 5:0$ $O < 5:1$	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	0	2	7
168	C0	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	0	1	7
169	C0	2	$O \geq 5:0$ $O < 5:1$	4, 9, 14, 19, 24, 29, 34, 39	0	1	7
170	C0	2	$O \geq 5:0$	case A: 4, 9, 11, 13, 14, 15,	0	2	7
			$O < 5:1$	17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39			
171	C0	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	7
172	C0	2	$O \geq 5:0$ $O < 5:1$	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	0	2	7
173	C0	2	$O \geq 5:0$ $O < 5:1$	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	7
174	C0	4	$O \geq 5:0$ $O < 5:$	case A: 4, 9, 11, 13, 14, 15, 17, 19	0	2	7
			1	case B: 24, 29, 31, 33, 34, 35, 37, 39			
175	C0	4	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	7
176	C0	8	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	7
177	C2	1	0	case A: 9 case B: 39	0	2	2
178	C2	1	0	case A: 9 case B: 29	0	2	2
179	C2	1	0	case A: 4, 9	0	1	2
				case B: 29, 39			
180	C2	1	0	case A: 4, 9, 19 case B: 29, 34, 39	0	1	2

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
181	C2	1	0	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	0	1	2
182	C2	1	0	case A: 16, 17, 18, 19 case B: 33, 35, 37, 39	0	2	2
183	C2	1	0	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	0	2	2
184	C2	1	0	case A: 9, 11, 13, 15, 17, 19 case B: 29, 31, 33, 35, 37, 39	0	2	2
185	C2	1	0	case A: 4, 9, 14, 19, 24, 29 case B: 14, 19, 24, 29, 34, 39	0	1	2
186	C2	1	0	4, 9, 14, 19, 24, 29, 34, 39	0	1	2
187	C2	1	0	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	2
188	C2	1	0	case A: 12, 13, 14, 15, 16, 17, 18, 19 case B: 32, 33, 34, 35, 36, 37, 38, 39	0	2	2
189	C2	1	0	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	2
190	C2	1	0	4, 9, 11, 13, 15, 17, 19, 24, 29, 31, 33, 35, 37,	0	2	2
				39			
191	C2	1	0	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	0	2	2
192	C2	1	0	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	2
193	C2	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9 case B: 29, 39	0	2	2
194	C2	2	$O \geq 5:0$ $O < 5:1$	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	0	2	2
195	C2	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	0	1	2
196	C2	2	$O \geq 5:$	4, 9, 14, 19, 24,	0	1	2

EP 3 742 848 A1

(continued)

5	PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
			x	y				
				0 O<5: 1	29, 34, 39			
10	197	C2	2	O≥5:0 O<5:1	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	2
15	198	C2	2	O≥5:0 O<5:1	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	2
20	199	C2	2	O≥5:0 O<5:1	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	0	2	2
25	200	C2	2	O≥5:0 O<5:1	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32,	0	2	2
					33, 34, 35, 36, 37, 38, 39			
30	201	C2	4	O≥5:0 O<5:1	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	2
35	202	C2	4	O≥5:0 O<5:1	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	2
40	203	C2	8	O≥5:0 O<5:1	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	2
	204	C2	8	O≥5:0 O<5:	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17,	0	2	2
45				1	18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39			
50	205	C2	16	O≥5:0 O<5:1	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	2
55	206	C2	16	O≥5:0 O<5:1	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	2

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
207	A1/B1	1	0	case A: 9 case B: 29	0	2	7
208	A1/B1	1	0	case A: 4, 9 case B: 29, 39	0	2	7
209	A1/B1	1	0	case A: 4, 9, 19	0	1	7
				case B: 29, 34, 39			
210	A1/B1	1	0	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	0	1	7
211	A1/B1	1	0	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	0	2	7
212	A1/B1	1	0	4, 9, 14, 19, 24, 29, 34, 39	0	1	7
213	A1/B1	1	0	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	7
214	A1/B1	1	0	case A: 12, 13, 14, 15, 16, 17, 18, 19 case B: 32, 33, 34, 35, 36, 37, 38, 39	0	2	7
215	A1/B1	1	0	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	7
216	A1/B1	1	0	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	0	2	7
217	A1/B1	1	0	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	7
218	A1/B1	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	7
219	A1/B1	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	7
220	A1/B1	2	$O \geq 5:0$ $O < 5:1$	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	0	2	7

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
221	A1/B1	2	$O \geq 5:0$ $O < 5:1$	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	7
222	A2/B2	1	0	case A: 9 case B: 29	0	2	3
223	A2/B2	1	0	case A: 4, 9 case B: 29, 39	0	2	3
224	A2/B2	1	0	case A: 4, 9, 19 case B: 29, 34, 39	0	1	3
225	A2/B2	1	0	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	0	1	3
226	A2/B2	1	0	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	0	2	3
227	A2/B2	1	0	4, 9, 14, 19, 24, 29, 34, 39	0	1	3
228	A2/B2	1	0	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	3
229	A2/B2	1	0	case A: 12, 13, 14, 15, 16, 17, 18, 19 case B: 32, 33, 34, 35, 36, 37, 38, 39	0	2	3
230	A2/B2	1	0	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	3
231	A2/B2	1	0	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	0	2	3
232	A2/B2	1	0	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	3
233	A2/B2	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	3
234	A2/B2	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	3

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
235	A2/B2	2	$O \geq 5:0$ $O < 5:1$	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	0	2	3
236	A2/B2	2	$O \geq 5:0$ $O < 5:1$	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	3
237	A3/B3	1	0	case A: 9 case B: 29	0	2	2
238	A3/B3	1	0	case A: 4, 9 case B: 29, 39	0	1	2
239	A3/B3	1	0	case A: 4, 9, 19 case B: 29, 34, 39	0	1	2
240	A3/B3	1	0	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	0	1	2
241	A3/B3	1	0	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	0	2	2
242	A3/B3	1	0	4, 9, 14, 19, 24, 29, 34, 39	0	1	2
243	A3/B3	1	0	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	2
244	A3/B3	1	0	case A: 12, 13, 14, 15, 16, 17, 18, 19 case B: 32, 33, 34, 35, 36, 37, 38, 39	0	2	2
245	A3/B3	1	0	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	2
246	A3/B3	1	0	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	0	2	2
247	A3/B3	1	0	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	2
248	A3/B3	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	0	2	2

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
249	A3/B3	2	$O \geq 5:0$ $O < 5:1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	2
250	A3/B3	2	$O \geq 5:0$ $O < 5:1$	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	0	2	2
251	A3/B3	2	$O \geq 5:0$ $O < 5:1$	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	0	2	2
252							
253							
254							
255							

Table 5

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol (Ns)	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
0	A1	1	0	case A: 9 case B: 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$
1	A1	1	0	case A: 9 case B: 29	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$
2	A1	1	0	case A: 4, 9 case B: 29, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/2]$
3	A1	1	0	case A: 4, 9, 19 case B: 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/2]$
4	A1	1	0	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/2]$
5	A1	1	0	case A: 16, 17, 18, 19 case B: 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$
6	A1	1	0	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$
7	A1	1	0	case A: 9, 11, 13, 15, 17, 19 case B: 29, 31, 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol (Ns)	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
8	A1	1	0	case A: 4, 9, 14, 19, 24, 29 case B: 14, 19, 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/2]$
9	A1	1	0	4, 9, 14, 19, 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/2]$
10	A1	1	0	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$
11	A1	1	0	case A: 12, 13, 14, 15, 16, 17, 18, 19 case B: 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$
12	A1	1	0	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$
13	A1	1	0	4, 9, 11, 13, 15, 17, 19, 24, 29, 31, 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$
14	A1	1	0	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$
15	A1	1	0	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$
16	A1	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9 case B: 29, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$
17	A1	2	$O \geq 5: 0$ $O < 5: 1$	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$
18	A1	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/2]$
19	A1	2	$O \geq 5: 0$ $O < 5: 1$	4, 9, 14, 19, 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/2]$
20	A1	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/2]$

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol (Ns)	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
21	A1	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/2]$
22	A1	2	$O \geq 5: 0$ $O < 5: 1$	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/2]$
23	A1	2	$O \geq 5: 0$ $O < 5: 1$	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/2]$
24	A1	4	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/2]$
25	A1	4	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/2]$
26	A1	8	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/2]$
27	A1	8	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/2]$
28	A1	16	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/2]$
29	A1	16	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/2]$
30	A2	1	0	case A: 9 case B: 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/4]$
31	A2	1	0	case A: 9 case B: 29	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/4]$
32	A2	1	0	case A: 4, 9 case B: 29, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-Ns)/4]$
33	A2	1	0	case A: 4, 9, 19 case B: 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-Ns)/4]$

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol (Ns)	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
34	A2	1	0	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/4]$
35	A2	1	0	case A: 16, 17, 18, 19 case B: 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
36	A2	1	0	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
37	A2	1	0	case A: 9, 11, 13, 15, 17, 19 case B: 29, 31, 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
38	A2	1	0	case A: 4, 9, 14, 19, 24, 29 case B: 14, 19, 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/4]$
39	A2	1	0	4, 9, 14, 19, 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/4]$
40	A2	1	0	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
41	A2	1	0	case A: 12, 13, 14, 15, 16, 17, 18, 19 case B: 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
42	A2	1	0	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
43	A2	1	0	4, 9, 11, 13, 15, 17, 19, 24, 29, 31, 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
44	A2	1	0	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
45	A2	1	0	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
46	A2	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9 case B: 29, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
47	A2	2	$O \geq 5: 0$ $O < 5: 1$	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
48	A2	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/4]$

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol (Ns)	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
49	A2	2	$O \geq 5: 0$ $O < 5: 1$	4, 9, 14, 19, 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/4]$
50	A2	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
51	A2	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
52	A2	2	$O \geq 5: 0$ $O < 5: 1$	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
53	A2	2	$O \geq 5: 0$ $O < 5: 1$	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
54	A2	4	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
55	A2	4	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
56	A2	8	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
57	A2	8	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
58	A2	16	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
59	A2	16	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol (Ns)	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
5 60	A3	1	0	case A: 9 case B: 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/6]$
10 61	A3	1	0	case A: 9 case B: 29	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/6]$
15 62	A3	1	0	case A: 4, 9 case B: 29, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/6]$
15 63	A3	1	0	case A: 4, 9, 19 case B: 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/6]$
20 64	A3	1	0	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/6]$
20 65	A3	1	0	case A: 16, 17, 18, 19 case B: 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/6]$
25 66	A3	1	0	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/6]$
25 67	A3	1	0	case A: 9, 11, 13, 15, 17, 19 case B: 29, 31, 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/6]$
30 68	A3	1	0	case A: 4, 9, 14, 19, 24, 29 case B: 14, 19, 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/6]$
30 69	A3	1	0	4, 9, 14, 19, 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/6]$
35 70	A3	1	0	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/6]$
40 71	A3	1	0	case A: 12, 13, 14, 15, 16, 17, 18, 19 case B: 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/6]$
45 72	A3	1	0	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/6]$
50 73	A3	1	0	4, 9, 11, 13, 15, 17, 19, 24, 29, 31, 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/6]$
50 74	A3	1	0	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/6]$
55 75	A3	1	0	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/6]$
55 76	A3	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9 case B: 29, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/6]$

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol (Ns)	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
77	A3	2	$O \geq 5: 0$ $O < 5: 1$	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/6]$
78	A3	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-Ns)/6]$
79	A3	2	$O \geq 5: 0$ $O < 5: 1$	4, 9, 14, 19, 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-Ns)/6]$
80	A3	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/6]$
81	A3	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/6]$
82	A3	2	$O \geq 5: 0$ $O < 5: 1$	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/6]$
83	A3	2	$O \geq 5: 0$ $O < 5: 1$	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/6]$
84	A3	4	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/6]$
85	A3	4	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/6]$
86	A3	8	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/6]$
87	A3	8	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/6]$

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol (Ns)	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
88	A3	16	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/6]$
89	A3	16	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/6]$
90	B1	1	0	case A: 9 case B: 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/2]$
91	B1	1	0	case A: 9 case B: 29	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/2]$
92	B1	1	0	case A: 4, 9 case B: 29, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-Ns)/2]$
93	B1	1	0	case A: 4, 9, 19 case B: 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-Ns)/2]$
94	B1	1	0	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-Ns)/2]$
95	B1	1	0	case A: 16, 17, 18, 19 case B: 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/2]$
96	B1	1	0	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/2]$
97	B1	1	0	case A: 9, 11, 13, 15, 17, 19 case B: 29, 31, 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/2]$
98	B1	1	0	case A: 4, 9, 14, 19, 24, 29 case B: 14, 19, 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-Ns)/2]$
99	B1	1	0	4, 9, 14, 19, 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-Ns)/2]$
100	B1	1	0	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/2]$
101	B1	1	0	case A: 12, 13, 14, 15, 16, 17, 18, 19 case B: 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/2]$
102	B1	1	0	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/2]$
103	B1	1	0	4, 9, 11, 13, 15, 17, 19, 24, 29, 31, 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/2]$

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol (Ns)	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
104	B1	1	0	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
105	B1	1	0	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
106	B1	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9 case B: 29, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
107	B1	2	$O \geq 5: 0$ $O < 5: 1$	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
108	B1	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/2]$
109	B1	2	$O \geq 5: 0$ $O < 5: 1$	4, 9, 14, 19, 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/2]$
110	B1	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
111	B1	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
112	B1	2	$O \geq 5: 0$ $O < 5: 1$	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
113	B1	2	$O \geq 5: 0$ $O < 5: 1$	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
114	B1	4	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
115	B1	4	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol (Ns)	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
116	B1	8	$O \geq 5$: 0 $O < 5$: 1	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
117	B1	8	$O \geq 5$: 0 $O < 5$: 1	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
118	B1	16	$O \geq 5$: 0 $O < 5$: 1	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
119	B1	16	$O \geq 5$: 0 $O < 5$: 1	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
120	B4	1	0	case A: 9 case B: 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$
121	B4	1	0	case A: 9 case B: 29	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$
122	B4	1	0	case A: 4, 9 case B: 29, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/12]$
123	B4	1	0	case A: 4, 9, 19 case B: 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/12]$
124	B4	1	0	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/12]$
125	B4	1	0	case A: 16, 17, 18, 19 case B: 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$
126	B4	1	0	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$
127	B4	1	0	case A: 9, 11, 13, 15, 17, 19 case B: 29, 31, 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$
128	B4	1	0	case A: 4, 9, 14, 19, 24, 29 case B: 14, 19, 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/12]$
129	B4	1	0	4, 9, 14, 19, 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/12]$
130	B4	1	0	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol (Ns)	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
131	B4	1	0	case A: 12, 13, 14, 15, 16, 17, 18, 19 case B: 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/12]$
132	B4	1	0	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/12]$
133	B4	1	0	4, 9, 11, 13, 15, 17, 19, 24, 29, 31, 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/12]$
134	B4	1	0	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/12]$
135	B4	1	0	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/12]$
136	B4	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9 case B: 29, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/12]$
137	B4	2	$O \geq 5: 0$ $O < 5: 1$	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/12]$
138	B4	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-Ns)/12]$
139	B4	2	$O \geq 5: 0$ $O < 5: 1$	4, 9, 14, 19, 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-Ns)/12]$
140	B4	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/12]$
141	B4	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/12]$
142	B4	2	$O \geq 5: 0$ $O < 5: 1$	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/12]$

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol (Ns)	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
143	B4	2	$O \geq 5: 0$ $O < 5: 1$	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$
144	B4	4	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$
145	B4	4	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$
146	B4	8	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$
147	B4	8	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$
148	B4	16	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$
149	B4	16	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/12]$
150	C0	1	0	case A: 9 case B: 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)]$
151	C0	1	0	case A: 9 case B: 29	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)]$
152	C0	1	0	case A: 4, 9 case B: 29, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)]$
153	C0	1	0	case A: 4, 9, 19 case B: 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)]$
154	C0	1	0	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)]$
155	C0	1	0	case A: 16, 17, 18, 19 case B: 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)]$
156	C0	1	0	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)]$

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol (Ns)	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
157	C0	1	0	case A: 9, 11, 13, 15, 17, 19 case B: 29, 31, 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)]$
158	C0	1	0	case A: 4, 9, 14, 19, 24, 29 case B: 14, 19, 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-Ns)]$
159	C0	1	0	4, 9, 14, 19, 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-Ns)]$
160	C0	1	0	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)]$
161	C0	1	0	case A: 12, 13, 14, 15, 16, 17, 18, 19 case B: 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)]$
162	C0	1	0	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)]$
163	C0	1	0	4, 9, 11, 13, 15, 17, 19, 24, 29, 31, 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)]$
164	C0	1	0	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)]$
165	C0	1	0	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)]$
166	C0	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9 case B: 29, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)]$
167	C0	2	$O \geq 5: 0$ $O < 5: 1$	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)]$
168	C0	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-Ns)]$
169	C0	2	$O \geq 5: 0$ $O < 5: 1$	4, 9, 14, 19, 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-Ns)]$

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol (Ns)	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
170	C0	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)]$
171	C0	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)]$
172	C0	2	$O \geq 5: 0$ $O < 5: 1$	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)]$
173	C0	2	$O \geq 5: 0$ $O < 5: 1$	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)]$
174	C0	4	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)]$
175	C0	4	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)]$
176	C0	8	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)]$
177	C2	1	0	case A: 9 case B: 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/4]$
178	C2	1	0	case A: 9 case B: 29	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/4]$
179	C2	1	0	case A: 4, 9 case B: 29, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-Ns)/4]$
180	C2	1	0	case A: 4, 9, 19 case B: 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-Ns)/4]$
181	C2	1	0	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-Ns)/4]$
182	C2	1	0	case A: 16, 17, 18, 19 case B: 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/4]$
183	C2	1	0	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/4]$

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol (Ns)	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
184	C2	1	0	case A: 9, 11, 13, 15, 17, 19 case B: 29, 31, 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
185	C2	1	0	case A: 4, 9, 14, 19, 24, 29 case B: 14, 19, 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/4]$
186	C2	1	0	4, 9, 14, 19, 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/4]$
187	C2	1	0	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
188	C2	1	0	case A: 12, 13, 14, 15, 16, 17, 18, 19 case B: 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
189	C2	1	0	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
190	C2	1	0	4, 9, 11, 13, 15, 17, 19, 24, 29, 31, 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
191	C2	1	0	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
192	C2	1	0	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
193	C2	2	$O \geq 5:$ 0 $O < 5:$ 1	case A: 4, 9 case B: 29, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
194	C2	2	$O \geq 5:$ 0 $O < 5:$ 1	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-N_s)/4]$
195	C2	2	$O \geq 5:$ 0 $O < 5:$ 1	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/4]$
196	C2	2	$O \geq 5:$ 0 $O < 5:$ 1	4, 9, 14, 19, 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(13-N_s)/4]$

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol (Ns)	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
197	C2	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/4]$
198	C2	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/4]$
199	C2	2	$O \geq 5: 0$ $O < 5: 1$	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/4]$
200	C2	2	$O \geq 5: 0$ $O < 5: 1$	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/4]$
201	C2	4	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/4]$
202	C2	4	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/4]$
203	C2	8	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/4]$
204	C2	8	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/4]$
205	C2	16	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/4]$
206	C2	16	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(13-Ns)/4]$
207	A1/B1	1	0	case A: 9 case B: 29	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/2]$
208	A1/B1	1	0	case A: 4, 9 case B: 29, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/2]$

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol (Ns)	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
209	A1/B1	1	0	case A: 4, 9, 19 case B: 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/2]$
210	A1/B1	1	0	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/2]$
211	A1/B1	1	0	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
212	A1/B1	1	0	4, 9, 14, 19, 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/2]$
213	A1/B1	1	0	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
214	A1/B1	1	0	case A: 12, 13, 14, 15, 16, 17, 18, 19 case B: 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
215	A1/B1	1	0	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
216	A1/B1	1	0	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
217	A1/B1	1	0	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
218	A1/B1	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
219	A1/B1	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
220	A1/B1	2	$O \geq 5: 0$ $O < 5: 1$	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
221	A1/B1	2	$O \geq 5: 0$ $O < 5: 1$	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/2]$
222	A2/B2	1	0	case A: 9 case B: 29	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/4]$

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol (Ns)	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
223	A2/B2	1	0	case A: 4, 9 case B: 29, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/4]$
224	A2/B2	1	0	case A: 4, 9, 19 case B: 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/4]$
225	A2/B2	1	0	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/4]$
226	A2/B2	1	0	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/4]$
227	A2/B2	1	0	4, 9, 14, 19, 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-N_s)/4]$
228	A2/B2	1	0	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/4]$
229	A2/B2	1	0	case A: 12, 13, 14, 15, 16, 17, 18, 19 case B: 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/4]$
230	A2/B2	1	0	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/4]$
231	A2/B2	1	0	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/4]$
232	A2/B2	1	0	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/4]$
233	A2/B2	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/4]$
234	A2/B2	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/4]$
235	A2/B2	2	$O \geq 5: 0$ $O < 5: 1$	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/4]$
236	A2/B2	2	$O \geq 5: 0$ $O < 5: 1$	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-N_s)/4]$

EP 3 742 848 A1

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol (Ns)	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
237	A3/B3	1	0	case A: 9 case B: 29	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/6]$
238	A3/B3	1	0	case A: 4, 9 case B: 29, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-Ns)/6]$
239	A3/B3	1	0	case A: 4, 9, 19 case B: 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-Ns)/6]$
240	A3/B3	1	0	case A: 4, 9, 14, 19 case B: 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-Ns)/6]$
241	A3/B3	1	0	case A: 9, 11, 13, 15 case B: 33, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/6]$
242	A3/B3	1	0	4, 9, 14, 19, 24, 29, 34, 39	$\{l, 2l, k+l\}$	1	$\text{floor}[(14-Ns)/6]$
243	A3/B3	1	0	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/6]$
244	A3/B3	1	0	case A: 12, 13, 14, 15, 16, 17, 18, 19 case B: 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/6]$
245	A3/B3	1	0	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/6]$
246	A3/B3	1	0	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/6]$
247	A3/B3	1	0	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/6]$
248	A3/B3	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 11, 13, 14, 15, 17, 19 case B: 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/6]$
249	A3/B3	2	$O \geq 5: 0$ $O < 5: 1$	case A: 4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 case B: 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/6]$
250	A3/B3	2	$O \geq 5: 0$ $O < 5: 1$	4, 9, 11, 13, 14, 15, 17, 19, 24, 29, 31, 33, 34, 35, 37, 39	$\{l, 2l, k+l\}$	2	$\text{floor}[(14-Ns)/6]$

(continued)

PRACH Config. Index	Preamble format	SFN mod x = y		slot number (60 kHz SCS)	Starting symbol (Ns)	Number of PRACH slots within a 0.25 ms	Number of ROs within a RACH slot
		x	y				
251	A3/B3	2	$O \geq 5:$ 0 $O < 5:$ 1	4, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 24, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39	{l, 2l, k+l}	2	$\text{floor}[(14 - N_s)/6]$
252							
253							
254							
255							

[0149] It should be understood that, as shown in Table 2 to Table 5, in this embodiment of this application, the configuration index may be a PRACH configuration index (PRACH Configuration Index). The first indication information may be a sequence number (corresponding to y in the tables, where for example, the configuration period is 4, and the first indication information, namely, y, may be 0, 1, 2, or 3) of a RACH system frame in the configuration period. For example, the first indication information may be a value of a RACH system frame number (system frame number, SFN) mod (mod) the configuration period (corresponding to x in the tables). The second indication information may be a subframe number in the first time unit indicated by the first indication information or an index of 0.25 ms in a system frame. The third indication information may be a quantity of PRACH slots (PRACH slot) in each subframe or 0.25 ms. The fourth indication information may be a quantity of ROs in a PRACH slot (Number of ROs within a RACH slot). The fifth indication information may be a sequence number of a starting symbol (Starting symbol) in the PRACH slot.

[0150] It should be understood that, configuration information corresponding to the configuration indexes in Table 2 to Table 5 may further include a preamble format (format). This embodiment of this application is not limited thereto.

[0151] Specifically, in this embodiment of this application, an optional value of a PRACH configuration sequence number is 0 to 255. A random access short preamble sequence format may be A1, A2, A3, B1, B4, A1/B1, A2/B2, A3/B3, C0, or C2. An optional value of the configuration period is {1, 2, 4, 8, 16}, where configuration period duration corresponding to configuration periods 1, 2, 4, 8, and 16 is 10 ms, 20 ms, 40 ms, 80 ms, and 160 ms. The quantity of PRACH slots is a quantity of PRACH subframes included within a duration granularity of 1 ms for a frequency band below 6 GHz, or a quantity of PRACH subframes included within a duration granularity of 0.25 ms for a frequency band above 6 GHz, and a value of the quantity of PRACH slots may be 1 or 2.

[0152] In this embodiment of this application, the PRACH configuration table prestored by the network device and the terminal device is determined based on the time domain resource for the common signal block and/or the time domain information of the control channel resource set. Therefore, the following first describes, with reference to FIG. 4 (a schematic diagram of possible time domain distribution of an SSB and an RMSI CORESET below 6 GHz), a principle of determining the configuration information corresponding to Table 2 and Table 3, and describes, with reference to FIG. 5 (a schematic diagram of possible time domain distribution of an SSB and an RMSI CORESET above 6 GHz), a principle of determining the configuration information corresponding to Table 4 and Table 5.

[0153] FIG. 4 is a schematic diagram of possible time domain distribution of SSBs and RMSI CORESETs below 6 GHz in two system frames. As shown in FIG. 4, an SSB period of 5 ms ($L=4$ or 8) is used as an example in FIG. 4, and optional time domain position distribution of SSBs with subcarrier spacings of 15 kHz and 30 kHz and RMSI CORESETs with subcarrier spacings of 15 kHz and 30 kHz in two system frames (20 ms) are shown. It can be learned from FIG. 4 that, in a system frame whose system frame index is an odd number, a relatively small quantity of SSBs and RMSI CORESETs are distributed. Therefore, in this embodiment of this application, a resource for an RO that avoids the SSB and the RMSI CORESET may be configured in the system frame whose system frame index is an odd number.

[0154] FIG. 5 is a schematic diagram of possible time domain distribution of SSBs and RMSI CORESETs above 6 GHz in two system frames. As shown in FIG. 5, an SSB period of 5 ms ($L=64$) is used as an example in the figure, and optional time domain position distribution of SSBs with subcarrier spacings of 120 kHz and 240 kHz and RMSI CORESETs with subcarrier spacings of 60 kHz and 120 kHz in two system frames (20 ms) are shown. It can be learned that, if a time domain offset of the RMSI CORESET is relatively small, there are a relatively small quantity of optional time domain positions for distribution of an RMSI CORESET in the second half of an odd-numbered system frame. If a time domain offset of the RMSI CORESET is relatively large, there are a relatively small quantity of optional time domain positions

for distribution of an RMSI CORESET in the first half of an even-numbered system frame. Therefore, to avoid a conflict between a time domain position of the RO and time domain positions of the SSB and the RMSI CORESET as much as possible, during design of the PRACH configuration table, a random access system frame may be selected based on the time domain offset of the RMSI CORESET. For example, if the time domain offset of the RMSI CORESET is relatively small, for example, less than 5 ms, a system frame whose system frame index is an odd number is selected; or if the time domain offset of the RMSI CORESET is relatively large, for example, greater than 5 ms, a system frame whose system frame index is an even number is selected; and a resource for an RO that avoids the SSB and the RMSI CORESET is configured in these system frames.

[0155] Based on the foregoing analysis on FIG. 4 and FIG. 5, a principle of determining each piece of indication information in the PRACH configuration table is described in detail below with reference to a specific example.

[0156] It should be understood that, Table 2 to Table 5 in this embodiment of this application may be determined according to the principle described below. Optionally, Table 2 to Table 5 may alternatively be determined according to another principle. This embodiment of this application is not limited thereto.

[0157] Optionally, Table 2 to Table 5 may not be determined according to the principle described below. To be specific, Table 2 to Table 5 may exist independently. This embodiment of this application is not limited thereto.

[0158] It should be further understood that, in this embodiment of this application, Table 2 to Table 5 are merely examples, and Table 2 to Table 5 are merely examples of the one-to-one correspondence between a plurality of configuration indexes and a plurality of pieces of configuration information that is prestored by the terminal device and the network device in this embodiment of this application. Examples of Table 2 to Table 5 are merely intended to help a person skilled in the art understand this embodiment of the present invention, but are not intended to limit this embodiment of the present invention to a specific value or a specific scenario in the examples. Apparently, a person skilled in the art can make various equivalent modifications or changes based on Table 2 to Table 5 that are provided, and such modifications or changes also fall within the scope of this embodiment of the present invention.

[0159] It should be understood that, in this embodiment of this application, Table 2 to Table 5 each include a plurality of configuration indexes and configuration information corresponding to the plurality of configuration indexes. Optionally, each configuration index and configuration information corresponding to the configuration index in Table 2 to Table 5 may be separately used. To be specific, Table 2 to Table 5 each may be split into a plurality of small tables. This embodiment of this application is not limited thereto.

[0160] It should be further understood that, in this embodiment of this application, an order of the configuration indexes and the configuration information corresponding to the configuration indexes in Table 2 to Table 5 is not limited. Positions of groups of the configuration indexes and the configuration information corresponding to the configuration indexes in Table 2 to Table 5 may be adjusted or randomly disordered. This embodiment of this application is not limited thereto.

[0161] It should be further understood that, numbers of the configuration indexes in Table 2 to Table 5 may start from any number, for example, may start from 0 (as shown in Table 4 and Table 5), or may not start from 0, for example, may start from 71 (as shown in Table 2 and Table 3); and the numbers of the configuration indexes may be sorted in ascending order, or may be sorted in any manner, provided that the network device and the terminal device have a consistent understanding of the correspondence between the configuration index and the configuration information indicated by the configuration index. This embodiment of this application is not limited thereto.

[0162] It should be understood that, when a value of a random access preamble format (Preamble format) in the second column in Table 2 to Table 5 is in a form of a combination of two letters, namely, a form of "x/y", "x/y" represents a value of a specific format. In other words, "x/y" herein does not indicate that the format is x or the format is y, but "x/y" indicates that the format is "x/y". For example, when a configuration index in Table 5 is 248, a random access preamble format corresponding to the configuration index is A3/B3.

[0163] It should be understood that, in this embodiment of this application, a proportion of a format corresponding to the configuration index in Table 2 to Table 5 that is a form (for example, A1, A2, A3, B1, or B4) represented by a single letter is higher than a proportion of a format corresponding to a configuration index that is a form of a combination of two letters, namely, a form of "x/y" (for example, A1/B1, A2/B2, or A3/B3). For different formats, configured time domain resources for the RO may be the same.

[0164] It should be further understood that, a time domain resource for the RO that is configured for one of the formats in Table 2 to Table 5 may also be used to configure a time domain resource for the RO for another format. To be specific, for different sequence formats, configured time domain resources for the RO may be the same. This embodiment of this application is not limited thereto.

[0165] It should be further understood that, in the foregoing table, $O \geq 5$ may be replaced with $O \geq 5$, and $O < 5$ may be replaced with $O \leq 5$. This embodiment of this application is not limited thereto. " $\geq$ " indicates being greater than or equal to, and " $\leq$ " indicates being less than or equal to.

[0166] A principle of determining the first indication information is first described below.

[0167] Optionally, in an embodiment, the random access configuration period is greater than a preset duration threshold, the time domain information of the control channel resource set includes a time domain offset of the control channel

resource set, and the time domain offset of the control channel resource set indicates duration between a starting time domain position of a control channel resource set associated with the first common signal block in the common signal block detection window and a starting position of a system frame in which the control channel resource set is located; and the first indication information used to indicate the first time unit is determined based on the time domain offset of the control channel resource set.

[0168] Further, in another embodiment, when the time domain offset of the control channel resource set is greater than or equal to a preset offset threshold, a sequence number corresponding to a position of the first time unit indicated by the first indication information in the random access configuration period is an even number; or when the time domain offset of the control channel resource set is less than the preset offset threshold, a sequence number corresponding to a position of the first time unit indicated by the first indication information in the random access configuration period is an odd number.

[0169] Alternatively, when the offset is equal to a preset offset threshold, a sequence number corresponding to a position of the first time unit indicated by the first indication information in the random access configuration period is an odd number. This embodiment of this application is not limited thereto. Correspondingly, the foregoing embodiment may be changed into the following form:

[0170] When the time domain offset of the control channel resource set is greater than a preset offset threshold, a sequence number corresponding to a position of the first time unit indicated by the first indication information in the random access configuration period is an even number; or when the time domain offset of the control channel resource set is less than or equal to the preset offset threshold, a sequence number corresponding to a position of the first time unit indicated by the first indication information in the random access configuration period is an odd number.

[0171] It should be understood that, the offset in this specification may be a specific time value, or may be a parameter indicating the time value, and a corresponding offset threshold may be a specific offset value, or may be a parameter indicating the offset value. This embodiment of this application is not limited thereto.

[0172] Therefore, in this embodiment of this application, a position of the first time unit (namely, a system frame) to which the time domain resource for the RO belongs is determined based on a value of the time domain offset of the control channel resource set, thereby avoiding a conflict with a control channel resource to the greatest extent, increasing a quantity of valid ROs, and improving random access efficiency.

[0173] For example, for FIG. 5, when the PRACH configuration period is greater than 10 ms, to be specific, when a PRACH configuration period parameter $P > 1$ (namely, 10 ms), a system frame number SFN of the RO depends on a time domain offset O of the RMSI CORESET. If the time domain offset O of the RMSI CORESET is greater than or equal to a preset threshold, the system frame number of the RO satisfies that the $SNF \bmod P = 0$. If the time domain offset O of the RMSI CORESET is less than a preset threshold, the system frame number of the RO satisfies that the $SNF \bmod P = 1$. Optionally, the preset threshold may be one of 2, 2.5, 5, 7, and 7.5, and a unit of the preset threshold may be ms.

[0174] Specifically, the terminal device may obtain, based on the first configuration index, two system frame numbers in the configuration period that are indicated by the first indication information, and the terminal device may determine, based on the time domain offset O of the RMSI CORESET, that the resource for the RO belongs to a system frame corresponding to one of the two system frame numbers.

[0175] For example, as shown in Table 4 and Table 5, when a configuration index is 16, a corresponding configuration period is 2 (namely, 20 ms); and when the time domain offset O of the RMSI CORESET ≥ 5 (ms), a system frame number indicated by the first indication information satisfies that the $SNF \bmod P = 0$ (to be specific, the SFN is an even number); or when the time domain offset O of the RMSI CORESET < 5 , the system frame number indicated by the first indication information satisfies that the $SNF \bmod P = 1$ (to be specific, the SFN is an odd number). For another example, as shown in Table 4 and Table 5, when a configuration index is 56, a corresponding configuration period is 8 (namely, 80 ms); and when the time domain offset O of the RMSI CORESET ≥ 5 (ms), a sequence number of a system frame in the configuration period that is indicated by the first indication information may be 0 (to be specific, the SFN is an even number), and corresponds to the zeroth system frame in the configuration period. When the time domain offset O of the RMSI CORESET < 5 , a system frame number indicated by the first indication information may be 1 (to be specific, the SFN is an even number), and corresponds to the first system frame in the configuration period.

[0176] It should be understood that, as shown in Table 4 and Table 5, when a configuration period is 1 (namely, 10 ms), because the configuration period includes only one system frame, the first time unit indicated by the first indication information is the system frame.

[0177] Optionally, in another embodiment, the first indication information used to indicate the first time unit is determined based on the time domain position of the control channel resource set.

[0178] For example, as shown in Table 2 and Table 3, based on the foregoing analysis on FIG. 4, it can be learned that the system frame indicated by the first indication information may be a system frame that avoids the control channel resource set.

[0179] Therefore, in this embodiment of this application, the position of the first time unit to which the time domain

resource for the RO belongs is determined based on the time domain position of the control channel resource set, thereby avoiding a conflict with the time domain resource for the control channel resource set as much as possible, increasing a quantity of valid ROs, and improving random access efficiency.

[0180] A principle of determining the second indication information is described below.

[0181] Optionally, in another embodiment, the second indication information used to indicate the at least one second time unit is determined based on a time domain position of the common signal block.

[0182] Further, in another embodiment, the at least one second time unit indicated by the second indication information is located at a time domain position other than an optional time domain position of the common signal block in the first time unit.

[0183] It should be understood that, the indication information of the second time unit may be a subframe number (subframe number) in the fourth last column in Table 2 and Table 3, or may be a sequence number of a slot (0.25 ms) corresponding to a subcarrier spacing of 60 kHz in a system frame in the fourth last column in Table 4 and Table 5.

[0184] For example, for a frequency band below 3 GHz, when a subcarrier spacing for an SSB is 15 kHz, sequence numbers of subframes that are not located at an optional time domain position of the SSB in the system frame in which the RO is located include {2, 3, 4, 7, 8, 9}. When a subcarrier spacing for an SSB is 30 kHz, sequence numbers of subframes that are not located at an optional time domain position of the SSB in the system frame in which the RO is located include {1, 2, 3, 4, 6, 7, 8, 9}. For a frequency band from 3 GHz to 6 GHz, when a subcarrier spacing for an SSB is 15 kHz, sequence numbers of subframes that are not located at an optional time domain position of the SSB in the system frame in which the RO is located include {4, 9}. When a subcarrier spacing for an SSB is 30 kHz, sequence numbers of subframes that are not located at an optional time domain position of the SSB in the system frame in which the RO is located include {2, 3, 4, 7, 8, 9}.

[0185] For example, as shown in Table 2, when a configuration index is 71, a corresponding subframe number is 9. When a configuration index is 79, corresponding subframe numbers are 3, 4, 8, and 9.

[0186] As shown in FIG. 5, for a frequency band above 6 GHz, when a subcarrier spacing for an SSB is 120 kHz, sequence numbers of slots (slots corresponding to a subcarrier spacing of 60 kHz, namely, 0.25 ms) that are not located at an optional time domain position of the SSB in the system frame in which the RO is located include {4, 9, 14, 19, 24, 29, 34, 39}. When a subcarrier spacing for an SSB is 240 kHz, sequence numbers of slots (slots corresponding to a subcarrier spacing of 60 kHz, namely, 0.25 ms) that are not located at an optional time domain position of the SSB in the system frame in which the RO is located include {4, 9 to 19, 24, 29 to 39}.

[0187] For example, as shown in Table 4 or Table 5, when a configuration index is 13, slots corresponding to the subcarrier spacing of 60 kHz in the system frame are 4, 9, 11, 13, 15, 17, 19, 24, 29, 31, 33, 35, 37, and 39.

[0188] Optionally, in another embodiment, the second indication information used to indicate the at least one second time unit is determined based on an optional time domain position of the common signal block and/or an index (for example, an SFN) of the first time unit.

[0189] Further, in another embodiment, the at least one second time unit includes a first group of second time units and a second group of second time units;

the first group of second time units is located at a time domain position other than an optional time domain position of the common signal block in the first half time domain part of the first time unit;

the second group of second time units is located at a time domain position other than an optional time domain position of the common signal block in the second half time domain part of the first time unit; and

when an index number of the first time unit is an even number, the time domain resource for the at least one random access preamble occasion RO belongs to the first group of second time units indicated by the second indication information; or

when an index number of the first time unit is an odd number, the time domain resource for the at least one random access preamble occasion RO belongs to the second group of second time units indicated by the second indication information.

[0190] Specifically, the terminal device may determine, based on the first configuration index, the two groups of second time units indicated by the first indication information, and the terminal device may determine, based on parity of the index of the first time unit, that the resource for the RO belongs to one of the two groups of second time units.

[0191] Specifically, a sequence number of a slot (a slot corresponding to a subcarrier spacing of 60 kHz, namely, 0.25 ms) in which the RO is located depends on the time domain offset O of the RMSI CORESET, and is a sequence number of a slot that is not located at an optional time domain position of the SSB.

[0192] If the time domain offset O of the RMSI CORESET is greater than or equal to the preset threshold, the sequence number of the slot in which the RO is located may include a sequence number of a slot that is not located at an optional time domain position of the SSB in a first half frame of a system frame (an even-numbered system frame).

[0193] If the time domain offset O of the RMSI CORESET is less than the preset threshold, the sequence number of the slot in which the RO is located may include a sequence number of a slot that is not located at an optional time domain position of the SSB in a second half frame of a system frame (odd-numbered).

[0194] Optionally, the preset threshold may be any one of 2, 2.5, 5, 7, and 7.5. This embodiment of this application is not limited thereto.

[0195] The preset threshold of 5 is used as an example. When the time domain offset O of the RMSI CORESET ≥ 5 , for a subcarrier spacing of 120 kHz for an SSB, sequence numbers of slots that are not located at an optional time domain position of the SSB in the system frame in which the RO is located (namely, sequence numbers of slots corresponding to a subcarrier spacing of 60 kHz) include {4, 9, 14, 19}. For a subcarrier spacing of 240 kHz for an SSB, sequence numbers of slots that are not located at an optional time domain position of the SSB in the system frame in which the RO is located (namely, sequence numbers of slots corresponding to a subcarrier spacing of 60 kHz) include {4, 9 to 19}. When the time domain offset O of the RMSI CORESET < 5 , for a subcarrier spacing of 120 kHz for an SSB, sequence numbers of slots that are not located at an optional time domain position of the SSB in the system frame in which the RO is located (namely, sequence numbers of slots corresponding to a subcarrier spacing of 60 kHz) include {24, 29, 34, 39}. For a subcarrier spacing of 240 kHz for an SSB, sequence numbers of slots that are not located at an optional time domain position of the SSB in the system frame in which the RO is located (namely, sequence numbers of slots corresponding to a subcarrier spacing of 60 kHz) include {24, 29 to 39}.

[0196] For example, as shown in Table 4 and Table 5, when a configuration index is 0, a corresponding system frame number is 0, and a sequence number of a slot corresponding to a subcarrier spacing of 60 kHz in the system frame corresponding to the time domain resource for the RO is Case A (namely, a system frame whose index number is an even number): 9, or Case B (namely, a system frame whose index number is an odd number): 39. When a system frame number is 0, to be specific, the index number of the system frame is an even number, Case A is satisfied. Therefore, when the configuration index is 0, the resource for the RO is located in a slot with a slot sequence number of 9 corresponding to the subcarrier spacing of 60 kHz in the system frame.

[0197] For another example, when a configuration index is 16, sequence numbers of slots corresponding to a subcarrier spacing of 60 kHz in the system frame corresponding to the time domain resource for the RO are Case A (namely, a system frame whose index number is an even number): 4 and 9, or Case B (namely, a system frame whose index number is an odd number): 29 and 39. When a system frame number is 0, to be specific, the index number of the system frame is an even number, Case A is satisfied. Therefore, when the configuration index is 16, and when it is determined that the system frame number is 0, the resource for the RO is located in slots 4 and 9 corresponding to the subcarrier spacing of 60 kHz in the system frame. When the system frame number is 1, to be specific, the index number of the system frame is an odd number, Case B is satisfied. Therefore, when the configuration index is 16, and when it is determined that the system frame number is 1, the resource for the RO is located in slots with slot sequence numbers of 29 and 39 corresponding to the subcarrier spacing of 60 kHz in the system frame.

[0198] It can be learned from the foregoing description that, if the time domain offset O of the RMSI CORESET is greater than or equal to the preset threshold, it corresponds to a system frame whose index number is an even number; or if the time domain offset O of the RMSI CORESET is less than the preset threshold, it corresponds to a system frame whose index number is an odd number.

[0199] Therefore, optionally, in another embodiment, when the configuration period is greater than 1, the determining the second time unit based on parity of the index of the first time unit may be expressed as determining the second time unit based on the time domain offset of the control channel resource set.

[0200] Specifically, in another embodiment, when the configuration period is greater than 1, the second indication information used to indicate the at least one second time unit is determined based on the optional time domain position of the SSB and the time domain offset of the control channel resource set.

[0201] Further, in another embodiment, the at least one second time unit includes a first group of second time units and a second group of second time units;

the first group of second time units includes a time unit that is not located at the time domain position of the SSB and that is in a first half time domain part of the first time unit with an even-numbered index;

the second group of second time units includes a time unit that is not located at the time domain position of the SSB and that is in a second half time domain part of the first time unit with an odd-numbered index; and

when the time domain offset of the control channel resource set is greater than or equal to the preset offset threshold, the time domain resource for the at least one random access preamble occasion RO belongs to the first group of second time units indicated by the second indication information; or

when the time domain offset of the control channel resource set is less than the preset offset threshold, the time domain resource for the at least one random access preamble occasion RO belongs to the second group of second time units indicated by the second indication information.

[0202] Specifically, when the configuration period is greater than 1, the foregoing Case A may be modified as a case in which the offset of the control channel resource set is greater than or equal to the preset threshold. The foregoing Case B may be modified as a case in which the offset of the control channel resource set is less than the preset threshold.

[0203] Specifically, the terminal device may determine and obtain, based on the first configuration index, the two groups of second time units indicated by the first indication information, and the terminal device may determine, based

on a value of the offset of the control channel resource set, that the resource for the RO belongs to one of the two groups of second time units.

[0204] For example, as shown in Table 4 and Table 5, when a configuration index is 16, sequence numbers of slots corresponding to a subcarrier spacing of 60 kHz in the system frame corresponding to the time domain resource for the RO are Case A (the offset of the control channel resource set is greater than or equal to the preset threshold): 4 and 9, or Case B (the offset of the control channel resource set is less than the preset threshold): 29 and 39. Therefore, when the configuration index is 16, and when the offset of the control channel resource set is greater than or equal to the preset threshold, it is determined that the system frame number in the configuration period is 0. In this case, Case A is satisfied, and the resource for the RO is located in slots with slot sequence numbers of 4 and 9 corresponding to the subcarrier spacing of 60 kHz in the system frame. Therefore, when the configuration index is 16, and when the offset of the control channel resource set is less than the preset threshold, it is determined that the system frame number in the configuration period is 1. In this case, Case B is satisfied, and the resource for the RO is located in slots with slot sequence numbers of 29 and 39 corresponding to the subcarrier spacing of 60 kHz in the system frame.

[0205] A principle of determining the fifth indication information is described below.

[0206] Optionally, in an embodiment, the time domain information of the control channel resource set includes a time domain position of the control channel resource set in the third time unit; and the fifth indication information used to indicate the starting time domain position of the RO in the third time unit is determined based on a time domain position of the control channel resource set in the third time unit, and the starting time domain position of the RO in the third time unit is after a time domain position of a preset control channel resource set in the third time unit.

[0207] It should be understood that, the preset control channel resource set may be the last control channel resource set, the first control channel resource set, or an i^{th} control channel resource set in the third time unit, where i is an integer less than or equal to z , and z indicates a quantity of control channel resource sets in the third time unit. This embodiment of this application is not limited thereto.

[0208] Alternatively, optionally, in an embodiment, the starting time domain position that is of the RO in the third time unit and that is indicated by the fifth indication information is a starting time domain position of the third time unit or a preset time domain position in the third time unit.

[0209] Further, in another embodiment, the starting time domain position of the RO indicates a position, in the third time unit, of the first fourth time unit in at least one fourth time unit that is in the third time unit and that is occupied by the RO. In other words, the fifth indication information is a sequence number corresponding to the position. It should be understood that, the fourth time unit may be an OFDM symbol.

[0210] When the starting time domain position of the RO in the third time unit is after a time domain position of the last control channel resource set in the third time unit, a value of a sequence number of the fourth time unit corresponding to the starting time domain position of the RO in the third time unit is one of the following three:

one time a time domain length of the control channel resource set in the third time unit;
twice the time domain length of the control channel resource set in the third time unit; and
a sum of a sequence number of a starting fourth time unit in the control channel resource set in the third time unit and one time the time domain length of the control channel resource set.

[0211] For example, it is assumed that one time the time domain length of the control channel resource set is l , and a sequence number (which may also be referred to as a symbol offset of the control channel resource set) of the starting fourth time unit in the control channel resource set in the third time unit is k .

[0212] As shown in Table 3 or Table 5, the position, in the third time unit, of the first fourth time unit in the at least one fourth time unit that is in the third time unit and that is occupied by the RO may be l , $2l$, or $k+l$.

[0213] In other words, a time domain length between the first fourth time unit in the at least one fourth time unit that is in the third time unit and that is occupied by the RO and the starting fourth time unit in the third time unit is l , $2l$, or $k+l$.

[0214] Specifically, when the second time unit is determined above, if a principle of determining the second time unit is based on the offset of the control channel resource set and the time domain position of the SSB, the selected second time unit can basically avoid a conflict with the SSB and the control channel resource set. Therefore, in this case, the starting time domain position that is of the RO in the third time unit and that is indicated by the fifth indication information may be a starting time domain position of the third time unit or a preset time domain position in the third time unit.

[0215] For example, as shown in Table 2 and Table 4, a starting symbol position that is of the RO in the third time unit and that is indicated by the fifth indication information is 0. It should be understood that, the starting symbol position indicated by the fifth indication information in Table 2 and Table 4 is 0, but this embodiment of this application is not limited thereto. For example, the starting symbol position indicated by the fifth indication information in Table 2 and Table 4 may be replaced with 1, 2, 3, 4, 5, 6, 7, or the like, and preferably, may be replaced with 6 or 7. This embodiment of this application is not limited thereto.

[0216] When the second time unit is determined above, if the principle of determining the second time unit is based

on the time domain position of the SSB, the selected second time unit can avoid a conflict with the SSB, but it is difficult to exclude a conflict with the control channel resource set. Therefore, the starting symbol position of the RO needs to be determined based on a symbol position of the control channel resource set. Therefore, in this case, the starting time domain position that is of the RO in the third time unit and that is indicated by the fifth indication information is after the time domain position of the last control channel resource set in the third time unit.

[0217] Specifically, in the slot in which the RO is located, a starting symbol sequence number of the RO depends on duration l of the RMSI CORESET and a symbol offset k of the RMSI CORESET in the third time unit, and the starting symbol sequence number of the RO may include $\{l, 2l, k+l\}$. The duration l of the RMSI CORESET may be $\{1, 2, 3\}$ OFDM symbols, and the starting symbol sequence number (namely, k) of the RMSI CORESET may be 7. This embodiment of this application is not limited thereto.

[0218] A principle of determining the fourth indication information is described below.

[0219] Optionally, in an embodiment, the fourth indication information used to indicate the quantity of ROs in the third time unit is determined based on the starting time domain position of the RO in the third time unit and a length of a time domain resource occupied by the preamble sequence.

[0220] Further, in an embodiment, the quantity that is of ROs in the third time unit and that is indicated by the fourth indication information is less than or equal to a ratio of a length of a time domain resource between the starting time domain position of the RO and an ending time domain position of the third time unit to the length of the time domain resource occupied by the preamble sequence. In other words, the quantity that is of ROs in the third time unit and that is indicated by the fourth indication information is less than or equal to a maximum quantity of preamble sequences that can be carried on the time domain resource between the starting time domain position of the RO and the ending time domain position of the third time unit.

[0221] The following separately describes the fourth indication information in this embodiment of this application in two cases for the foregoing two different starting time domain of the RO.

First case:

[0222] When the starting time domain position of the RO is l , $2l$, or $k+l$, in this embodiment of this application, N_s may be used to indicate the starting time domain position of the RO. In this case, as shown in Table 3 or Table 5, the quantity that is of ROs in the third time unit and that is indicated by the fourth indication information may be shown in the last column in Table 2 or Table 4.

[0223] For example, as shown in Table 3, when a configuration index is 93, the length of the time domain resource between the starting time domain position of the RO and the ending time domain position of the third time unit is $14-N_s$, where 14 indicates a total quantity of symbols in a slot, and a symbol length of a preamble sequence is 2. Therefore, as shown in Table 3, a maximum value of the quantity that is of ROs in the third time unit and that is indicated by the fourth indication information is $\text{floor}[(14-N_s)/2]$, where $\text{floor}[]$ indicates rounding down.

[0224] It should be understood that, when a preamble sequence format is A1, A2, or A3, there is a guard interval of one symbol. Therefore, as shown in Table 3, the length of the time domain resource between the starting time domain position of the RO and the ending time domain position of the third time unit is $13-N_s$.

[0225] For example, as shown in Table 3, when a configuration index is 71, the length of the time domain resource between the starting time domain position of the RO and the ending time domain position of the third time unit is $13-N_s$, and a symbol length of a preamble sequence is 2. Therefore, as shown in Table 3, a maximum value of the quantity that is of ROs in the third time unit and that is indicated by the fourth indication information is $\text{floor}[(13-N_s)/2]$.

[0226] For another example, as shown in Table 5, when a configuration index is 119, the length of the time domain resource between the starting time domain position of the RO and the ending time domain position of the third time unit is $14-N_s$, where 14 indicates a total quantity of symbols in a slot, and a symbol length of a preamble sequence is 2. Therefore, as shown in Table 5, a maximum value of the quantity that is of ROs in the third time unit and that is indicated by the fourth indication information is $\text{floor}[(14-N_s)/2]$.

[0227] It should be understood that, when a preamble sequence format is A1, A2, or A3, there is a guard interval of one symbol. Therefore, as shown in Table 5, the length of the time domain resource between the starting time domain position of the RO and the ending time domain position of the third time unit is $13-N_s$.

[0228] For example, as shown in Table 5, when a configuration index is 0, the length of the time domain resource between the starting time domain position of the RO and the ending time domain position of the third time unit is $13-N_s$, and a symbol length of a preamble sequence is 2. Therefore, as shown in Table 5, a maximum value of the quantity that is of ROs in the third time unit and that is indicated by the fourth indication information is $\text{floor}[(13-N_s)/2]$.

Second case:

[0229] When the starting symbol position that is of the RO in the third time unit and that is indicated by the fifth indication

information is 0 or a preset position, as shown in Table 2 or Table 4, the quantity that is of ROs in the third time unit and that is indicated by the fourth indication information may be shown in the last column in Table 2 or Table 4.

[0230] As shown in Table 2, when a configuration index is 93, the length of the time domain resource between the starting time domain position of the RO and the ending time domain position of the third time unit is 14 (14-0), where 14 indicates a total quantity of symbols in a slot, and a symbol length of a preamble sequence is 2. Therefore, as shown in Table 2, a maximum value of the quantity that is of ROs in the third time unit and that is indicated by the fourth indication information is 7 (namely, $14/2$).

[0231] It should be understood that, when a preamble sequence format is A1, A2, or A3, there is a guard interval of one symbol. Therefore, as shown in Table 3, the length of the time domain resource between the starting time domain position of the RO and the ending time domain position of the third time unit may be 13.

[0232] For example, as shown in Table 2, when a configuration index is 71, the length of the time domain resource between the starting time domain position of the RO and the ending time domain position of the third time unit is 13, and a symbol length of a preamble sequence is 2. Therefore, as shown in Table 2, a maximum value of the quantity that is of ROs in the third time unit and that is indicated by the fourth indication information is 6 (namely, $\text{floor}[(13-0)/2]$).

[0233] For another example, as shown in Table 4, when a configuration index is 119, the length of the time domain resource between the starting time domain position of the RO and the ending time domain position of the third time unit is 14, where 14 indicates a total quantity of symbols in a slot, and a symbol length of a preamble sequence is 2. Therefore, as shown in Table 4, a maximum value of the quantity that is of ROs in the third time unit and that is indicated by the fourth indication information is 7.

[0234] It should be understood that, when a preamble sequence format is A1, A2, or A3, there is a guard interval of one symbol. Therefore, as shown in Table 4, the length of the time domain resource between the starting time domain position of the RO and the ending time domain position of the third time unit is 13.

[0235] For example, as shown in Table 4, when a configuration index is 0, the length of the time domain resource between the starting time domain position of the RO and the ending time domain position of the third time unit is 13, and a symbol length of a preamble sequence is 2. Therefore, as shown in Table 4, a maximum value of the quantity that is of ROs in the third time unit and that is indicated by the fourth indication information is 6.

[0236] It should be understood that, in this embodiment of this application, Table 2 and Table 3 correspond to each other and are both short preamble sequence PRACH configuration tables below 6 GHz in TDD. A difference between Table 2 and Table 3 lies in that the fifth indication information in Table 2 is one of $\{l, 2l, k+l\}$, and the fifth indication information in Table 3 is 0. Correspondingly, forms of the fourth indication information in Table 2 and Table 3 are also different.

[0237] It should be understood that, in this embodiment of this application, Table 4 and Table 5 correspond to each other and are both short preamble sequence PRACH configuration tables above 6 GHz in TDD. A difference between Table 4 and Table 5 lies in that the fifth indication information in Table 4 is one of $\{l, 2l, k+l\}$, and the fifth indication information in Table 5 is 0. Correspondingly, forms of the fourth indication information in Table 4 and Table 5 are also different.

[0238] Optionally, in an embodiment, the method shown in FIG. 3 may further include: sending, by the terminal device, a preamble sequence on the time domain resource for the at least one RO that is configured by using the first configuration information.

[0239] Specifically, after the terminal device obtains the index indication information, the terminal device may determine, in the prestored one-to-one correspondence between a plurality of configuration indexes and a plurality of sets of configuration information based on the first configuration index, the first configuration information corresponding to the first configuration index, and then the terminal device may determine the time domain resource for the at least one RO based on the first configuration information. Then the terminal device may send the preamble sequence on the time domain resource for the at least one RO.

[0240] Specifically, the terminal device may send a preamble sequence on a time domain resource for some or all ROs in the time domain resource for the at least one RO. This embodiment of this application is not limited thereto.

[0241] Therefore, in this embodiment of this application, the time domain resource for the RO is determined based on the time domain resource for the common signal block and/or the time domain information of the control channel resource set, thereby reducing a probability that the resource for the RO collides with a downlink resource (for example, an SSB and/or an RMSI CORESET), increasing a quantity of valid ROs in a PRACH configuration period, and improving random access efficiency of the terminal device.

[0242] Alternatively, in another embodiment, when time domain resources for one or more ROs in the time domain resource for the at least one RO conflict with a time domain resource for the common signal block or a time domain resource for the control channel resource set, the method further includes:

skipping, by the terminal device, sending the preamble sequence on the time domain resources for the one or more ROs that conflict with the time domain resource for the common signal block or the time domain resource for the control channel resource set.

[0243] It should be understood that, a "conflict" in this embodiment of this application may indicate that, in a TDD system, an uplink resource for the RO that is determined by the terminal device overlaps the time domain resource for the common signal block or a time domain position of a downlink resource for the control channel resource set.

[0244] Specifically, the time domain resource configured for the RO above in this specification can avoid a conflict with the SSB or the control channel resource set as much as possible, but there is still a possibility of a conflict. In this embodiment of this application, once the terminal device determines that the time domain resources for the one or more ROs in the time domain resource for the at least one RO conflict with the time domain resource for the common signal block or the time domain resource for the control channel resource set, the terminal device may not send a preamble sequence on a conflicting time domain resource for the RO.

[0245] Therefore, in this embodiment of this application, when a resource conflict exists, a preamble sequence is not sent on a conflicting resource, thereby avoiding unnecessary and useless work, and avoiding a random access failure.

[0246] Alternatively, in another embodiment, when time domain resources for one or more ROs in the time domain resource for the at least one RO are located on a non-uplink resource in a semi-static uplink/downlink configuration, the method further includes:

sending, by the terminal device, a preamble sequence on the time domain resource for the at least one RO that is configured by using the first configuration information.

[0247] Specifically, the terminal device determines that the time domain resources for the one or more ROs in the time domain resource for the at least one RO do not match the semi-static uplink/downlink configuration. In this case, the terminal device may still send the preamble sequence on the time domain resources for the one or more ROs.

[0248] Therefore, in this embodiment of this application, the preamble sequence is still sent when a selected time domain resource for one group of ROs does not match the semi-static uplink/downlink configuration, thereby improving a success rate of random access.

[0249] Alternatively, in another embodiment, the starting time domain position that is of the RO in the third time unit and that is indicated by the fifth indication information is a non-uplink resource in the semi-static uplink/downlink configuration of the third time unit, and the method shown in FIG. 3 may further include:

updating, by the terminal device, the time domain position of the RO based on the semi-static uplink/downlink configuration of the third time unit; and

sending, by the terminal device, a preamble sequence based on an updated time domain position of the RO.

[0250] Further, in another embodiment, the updating, by the terminal device, the time domain position of the RO based on the semi-static uplink/downlink configuration of the third time unit includes:

updating, by the terminal device, a starting position of an uplink symbol in the semi-static uplink/downlink configuration of the third time unit to the starting time domain position of the RO in the third time unit; and

updating, by the terminal device to the quantity of ROs in the third time unit, a smaller one of a quantity of ROs that can be carried on the uplink symbol in the semi-static uplink/downlink configuration of the third time unit and the quantity that is of ROs in the third time unit and that is indicated by the fourth indication information.

[0251] Specifically, in this embodiment of this application, UE sends a random access preamble only on a PRACH occasion (RO) in an uplink part in the semi-static uplink/downlink configuration. The uplink part in the uplink/downlink configuration includes semi-static uplink-only slots and a special slot that includes an uplink symbol. When a random access occasion (RO) indicated in a PRACH configuration is located in the special slot, and a difference between a total

quantity $N_{symbol}^{slot} = 14$ of symbols in one slot and a length $y2$ of the uplink symbol in the special slot is greater than a starting symbol sequence number of the RO indicated in the PRACH configuration, a starting symbol sequence number

of a random access preamble sent by the UE in the special slot is a difference $N_{symbol}^{slot} - y2$ between a total quantity of symbols in one slot and the length of the uplink symbol in the special slot. Correspondingly, a maximum quantity of ROs that can be supported in the special slot is $\min\{y2/L, N_{RO}\}$, where L is duration of the random access preamble, and N_{RO} is a quantity of ROs that are included in a RACH slot and that are indicated in the PRACH configuration. If a random access preamble format B1 is used, the duration L of the random access preamble = 2 OFDM symbols, the length $y2$ of the uplink symbol in the special slot = 7, and the quantity of ROs that are included in the RACH slot and that are indicated in the PRACH configuration is $N_{RO} = 7$. As shown in FIG. 6, the starting symbol sequence number

$N_{symbol}^{slot} - y2$ of the random access preamble sent by the UE in the special slot = 7, and the maximum quantity

$\min\{L_2/L_1, N_{RO}\}$ of ROs that can be supported in the special slot = 3.

[0252] The communication method in the foregoing embodiment of this application is described in FIG. 3. Another communication method in an embodiment of this application is described below with reference to FIG. 7.

[0253] The method 700 shown in FIG. 7 includes the following steps.

[0254] 710. A network device sends index indication information, where the index indication information is used to indicate a first configuration index.

[0255] Correspondingly, a terminal device receives the index indication information.

[0256] Specifically, 710 corresponds to 310. To avoid repetition, details are not described herein again.

[0257] 720. The terminal device determines, based on the first configuration index, first configuration information corresponding to the first configuration index, where the first configuration information is used to indicate a time domain resource for a first group of random access preamble occasions ROs or a time domain resource for a second group of ROs; the time domain resource for the first group of ROs and the time domain resource for the second group of ROs are located in a first time unit in a random access configuration period; and the time domain resource for the first group of ROs or the time domain resource for the second group of ROs is determined based on a time domain offset of the control channel resource set and/or an index of the first time unit.

[0258] For example, the terminal device may determine the time domain resources for the two groups of ROs based on the first configuration index.

[0259] Specifically, the terminal device may determine, based on a one-to-one correspondence between a plurality of configuration indexes and a plurality of sets of configuration information, the first configuration information corresponding to the first configuration index, where the first configuration index is one of the plurality of configuration indexes; and after determining the first configuration information, the terminal device may determine the time domain resources for the two groups of ROs based on the configuration information.

[0260] It should be understood that, in this embodiment of this application, both the terminal device and the network device learn of the one-to-one correspondence between a plurality of configuration indexes and a plurality of sets of configuration information in advance. In other words, both the terminal device and the network device prestore the one-to-one correspondence between a plurality of configuration indexes and a plurality of sets of configuration information.

[0261] It should be understood that, in this embodiment of this application, the one-to-one correspondence between a plurality of configuration indexes and a plurality of sets of configuration information may be a PRACH configuration table.

[0262] For example, the PRACH configuration table may be a short preamble sequence configuration table above 6 GHz in TDD, for example, Table 4 or Table 5 above.

[0263] It should be understood that, step 720 corresponds to step 320, and a difference between 720 and 320 lies in that the configuration information in 320 may indicate only a time domain resource for one group of ROs (for example, corresponding to Table 2 or Table 3 above), while, in 720, time domain resources for two groups of ROs may be indicated (for example, corresponding to Table 4 or Table 5 above). For a specific process of step 720, refer to the foregoing descriptions. To avoid repetition, detailed descriptions are appropriately omitted herein.

[0264] Optionally, in an embodiment, the first configuration information includes at least one of the following information:

first indication information used to indicate the first time unit in the random access configuration period;

second indication information used to indicate at least one second time unit in the first time unit, where the at least one second time unit includes a first group of second time units and a second group of second time units, the time domain resource for the first group of ROs belongs to the first group of second time units, and the time domain resource for the second group of ROs belongs to the second group of second time units;

third indication information used to indicate a quantity of third time units included in each second time unit in the first group of second time units and the second group of second time units;

fourth indication information used to indicate a quantity of ROs in the third time unit; and

fifth indication information used to indicate a starting time domain position of an RO in the third time unit.

[0265] Optionally, in an embodiment, the random access configuration period is greater than a preset duration threshold, and the time domain offset of the control channel resource set indicates duration between a starting time domain position of a control channel resource set associated with the first common signal block in the common signal block detection window and a starting position of a system frame in which the control channel resource set is located; and the first indication information used to indicate the first time unit is determined based on the time domain offset of the control channel resource set.

[0266] Optionally, in an embodiment, when the time domain offset of the control channel resource set is greater than or equal to a preset offset threshold, a sequence number corresponding to a position of the first time unit indicated by the first indication information in the random access configuration period is an even number; or

when the time domain offset of the control channel resource set is less than the preset offset threshold, a sequence

number corresponding to a position of the first time unit indicated by the first indication information in the random access configuration period is an odd number.

[0267] Optionally, in an embodiment, the second indication information used to indicate the at least one second time unit is determined based on a time domain position of the common signal block.

[0268] Optionally, in an embodiment, the at least one second time unit indicated by the second indication information is located at a time domain position other than an optional time domain position of the common signal block in the first time unit.

[0269] Optionally, in an embodiment, the second indication information used to indicate the at least one second time unit is determined based on an optional time domain position of the common signal block and/or the index of the first time unit.

[0270] Optionally, in an embodiment, the first group of second time units is located at a time domain position other than an optional time domain position of the common signal block in the first half time domain part of the first time unit; the second group of second time units is located at a time domain position other than an optional time domain position of the common signal block in the second half time domain part of the first time unit; and

the determining, by the terminal device, a time domain resource for one group of ROs includes:

determining, by the terminal device, the time domain resource for the group of ROs based on the index of the first time unit, where when the index of the first time unit is an even number, the time domain resource for the group of ROs that is determined by the terminal device is the time domain resource for the first group of ROs; or when the index of the first time unit is an odd number, the time domain resource for the group of ROs that is determined by the terminal device is the time domain resource for the second group of ROs.

[0271] Optionally, in an embodiment, the preset offset threshold is one of 2, 2.5, 5, 7, and 7.5.

[0272] Optionally, in an embodiment, the fifth indication information used to indicate the starting time domain position of the RO in the third time unit is determined based on a time domain position of the control channel resource set in the third time unit, and the starting time domain position of the RO in the third time unit is after a time domain position of a preset control channel resource set in the third time unit; or the starting time domain position that is of the RO in the third time unit and that is indicated by the fifth indication information is a starting time domain position of the third time unit or a preset time domain position in the third time unit.

[0273] Optionally, in an embodiment, the starting time domain position of the RO indicates a position, in the third time unit, of the first fourth time unit in at least one fourth time unit that is in the third time unit and that is occupied by the RO; and when the starting time domain position of the RO in the third time unit is after a time domain position of the last control channel resource set in the third time unit, a value of a sequence number of the fourth time unit corresponding to the starting time domain position of the RO in the third time unit is one of the following three:

one time a time domain length of the control channel resource set in the third time unit;

twice the time domain length of the control channel resource set in the third time unit; and

a sum of a sequence number of a starting fourth time unit in the control channel resource set in the third time unit and one time the time domain length of the control channel resource set.

[0274] Optionally, in an embodiment, the fourth indication information used to indicate the quantity of ROs in the third time unit is determined based on the starting time domain position of the RO in the third time unit and a length of a time domain resource occupied by the preamble sequence.

[0275] Optionally, in an embodiment, the quantity that is of ROs in the third time unit and that is indicated by the fourth indication information is less than or equal to a ratio of a length of a time domain resource between the starting time domain position of the RO and an ending time domain position of the third time unit to the length of the time domain resource occupied by the preamble sequence.

[0276] 730. The terminal device determines a time domain resource for one group of ROs, where the time domain resource for the group of ROs is the time domain resource for the first group of ROs or the time domain resource for the second group of ROs.

[0277] Specifically, the network device may first determine a time domain resource for the common signal block and/or time domain information of the control channel resource set, and then the network device may determine the time domain resource for the RO (that is, determine configuration information corresponding to the time domain resource for the RO) based on the time domain resource for the common signal block and/or the time domain information of the control channel resource set. Subsequently, the network device may determine, based on the prestored one-to-one correspondence between a plurality of configuration indexes and a plurality of sets of configuration information, a configuration index corresponding to the time domain resource for the RO. Finally, the network device configures the first configuration index for the terminal device by using the index indication information. Further, the terminal device may determine, in the prestored one-to-one correspondence between a plurality of configuration indexes and a plurality of sets of configuration information based on the first configuration index, the first configuration information corresponding to the first configuration index, and then the terminal device may determine the time domain resources for the two groups of ROs based on the first configuration information, and select a time domain resource for one group of ROs from the time

domain resources for the two groups of ROs.

[0278] Therefore, in this embodiment of this application, the time domain resource for the RO is determined based on the time domain offset of the control channel resource set and/or the index of the first time unit, thereby reducing a probability that the resource for the RO collides with a downlink resource (for example, an SSB and/or an RMSI CORE-SET), increasing a quantity of valid ROs in a PRACH configuration period, and improving random access efficiency of the terminal device.

[0279] It should be understood that, the resource for the group of ROs that is determined in step 730 may correspond to the time domain resource for the at least one RO in step 320. An action of determining the resource for the group of ROs in FIG. 7 is similar to an action of determining the time domain resource for the at least one RO in FIG. 3. To avoid repetition, detailed descriptions are appropriately omitted herein.

[0280] Optionally, in an embodiment, the method shown in FIG. 7 may further include:

sending, by the terminal device, a preamble sequence on the determined time domain resource for the group of ROs.

[0281] Optionally, in an embodiment, when time domain resources for one or more ROs in the time domain resource for the group of ROs that is determined by the terminal device conflict with a time domain resource for the common signal block or a time domain resource for the control channel resource set, the method further includes:

skipping, by the terminal device, sending the preamble sequence on the time domain resources for the one or more ROs that conflict with the time domain resource for the common signal block or the time domain resource for the control channel resource set.

[0282] Optionally, in an embodiment, when time domain resources for one or more ROs in the time domain resource for the group of ROs that is determined by the terminal device are located on a non-uplink resource in a semi-static uplink/downlink configuration, the method further includes:

sending, by the terminal device, a preamble sequence on the determined time domain resource for the group of ROs.

[0283] It should be understood that, in this embodiment of this application, after the resource for the RO is determined, a processing manner used if there is a conflict between the resource for the RO and the time domain resource for the common signal block or the time domain resource for the control channel resource set, or a processing manner used when the resource for the RO does not match the semi-static uplink/downlink configuration may alternatively be an independent solution. To be specific, this processing manner may not be used in the configuration method for determining the resource for the RO in FIG. 3 or FIG. 7. This embodiment of this application is not limited thereto.

[0284] Specifically, in another embodiment, a method 800 shown in FIG. 8 includes the following steps.

[0285] 810. A network device sends index indication information, where the index indication information is used to indicate a first configuration index.

[0286] 820. A terminal device determines a time domain resource for at least one RO based on the first configuration index.

[0287] Specifically, in step 820, the time domain resource for the RO may be determined by using the foregoing method shown in FIG. 3 or FIG. 7, or in another manner, for example, a configuration in an existing standard is used to determine the time domain resource for the RO. This embodiment of this application is not limited thereto.

[0288] 830. When the terminal device determines that a resource conflict exists, the terminal device determines, based on a conflict status, to send or not send a preamble sequence.

[0289] It should be understood that, a "conflict" in this embodiment of this application may indicate that, in a TDD system, an uplink resource for the RO that is determined by the terminal device overlaps a time domain resource for a common signal block or a time domain position of a downlink resource for the control channel resource set, or indicates that time domain resources for one or more ROs in the time domain resource for the at least one RO does not match a semi-static uplink/downlink configuration.

[0290] Specifically, for description in 830, refer to the foregoing conflict processing manner in FIG. 3 or FIG. 7. To avoid repetition, details are not described herein again.

[0291] Therefore, in this embodiment of this application, when a resource conflict exists, a preamble sequence is not sent on a conflicting resource, thereby avoiding unnecessary and useless work, and avoiding a random access failure. In addition, in this embodiment of this application, the preamble sequence is still sent when a selected time domain resource for one group of ROs does not match the semi-static uplink/downlink configuration, thereby improving a success rate of random access.

[0292] It should be understood that, the examples in FIG. 1 to FIG. 8 above are merely intended to help a person skilled in the art understand the embodiments of the present invention, but are not intended to limit the embodiments of the present invention to a specific value or a specific scenario in the examples. A person skilled in the art apparently can make various equivalent modifications or changes according to the examples shown in FIG. 1 to FIG. 8, and such modifications or changes also fall within the scope of the embodiments of the present invention.

[0293] It should be understood that sequence numbers of the foregoing processes do not mean execution sequences in various embodiments of this application. The execution sequences of the processes should be determined according to functions and internal logic of the processes, and should not be construed as any limitation on the implementation

processes of the embodiments of this application.

[0294] The foregoing describes in detail the communication method in the embodiments of the present invention with reference to FIG. 1 to FIG. 8. The following describes communications devices in embodiments of this application with reference to FIG. 9 to FIG. 12. Specifically, a terminal device in an embodiment of this application is described with reference to FIG. 9 and FIG. 11, and a network device in an embodiment of the present invention is described with reference to FIG. 10 to FIG. 12.

[0295] FIG. 9 is a schematic block diagram of a terminal device according to an embodiment of this application. Specifically, the terminal device shown in FIG. 9 may be applied to the system shown in FIG. 1, and perform functions of the terminal device in the foregoing method embodiments.

[0296] The terminal device 900 shown in FIG. 9 includes a processing unit 910 and a transceiver unit 920.

[0297] In an implementation, the transceiver unit is configured to receive index indication information, where the index indication information is used to indicate a first configuration index; and the processing unit is configured to determine, based on the first configuration index, first configuration information corresponding to the first configuration index, where the first configuration information is used to indicate a time domain resource for at least one random access preamble occasion RO, and the first configuration information is determined based on a time domain resource for a common signal block and/or time domain information of a control channel resource set.

[0298] Therefore, in this embodiment of this application, the time domain resource for the RO is determined based on the time domain resource for the common signal block and/or the time domain information of the control channel resource set, thereby reducing a probability that the resource for the RO collides with a downlink resource (for example, an SSB and/or an RMSI CORESET), increasing a quantity of valid ROs in a PRACH configuration period, and improving random access efficiency of the terminal device.

[0299] Optionally, in another embodiment, the first configuration information includes at least one of the following information: first indication information used to indicate a first time unit in a random access configuration period; second indication information used to indicate at least one second time unit in the first time unit; third indication information used to indicate a quantity of third time units included in each of the at least one second time unit; fourth indication information used to indicate a quantity of ROs in the third time unit; and fifth indication information used to indicate a starting time domain position of an RO in the third time unit.

[0300] Optionally, in another embodiment, the random access configuration period is greater than a preset duration threshold, the time domain information of the control channel resource set includes a time domain offset of the control channel resource set, and the time domain offset of the control channel resource set indicates duration between a starting time domain position of a control channel resource set associated with the first common signal block in the common signal block detection window and a starting position of a system frame in which the control channel resource set is located; and the first indication information used to indicate the first time unit is determined based on the time domain offset of the control channel resource set.

[0301] Optionally, in another embodiment, when the time domain offset of the control channel resource set is greater than or equal to a preset offset threshold, a sequence number corresponding to a position of the first time unit indicated by the first indication information in the random access configuration period is an even number; or when the time domain offset of the control channel resource set is less than the preset offset threshold, a sequence number corresponding to a position of the first time unit indicated by the first indication information in the random access configuration period is an odd number.

[0302] Optionally, in another embodiment, the second indication information used to indicate the at least one second time unit is determined based on a time domain position of the common signal block.

[0303] Optionally, in another embodiment, the at least one second time unit indicated by the second indication information is located at a time domain position other than an optional time domain position of the common signal block in the first time unit.

[0304] Optionally, in another embodiment, the second indication information used to indicate the at least one second time unit is determined based on an optional time domain position of the common signal block and/or an index of the first time unit.

[0305] Optionally, in another embodiment, the at least one second time unit includes a first group of second time units and a second group of second time units; the first group of second time units is located at a time domain position other than an optional time domain position of the common signal block in the first half time domain part of the first time unit; the second group of second time units is located at a time domain position other than an optional time domain position of the common signal block in the second half time domain part of the first time unit; and when the index of the first time unit is an even number, the time domain resource for the at least one random access preamble occasion RO belongs to the first group of second time units indicated by the second indication information; or when the index of the first time unit is an odd number, the time domain resource for the at least one random access preamble occasion RO belongs to the second group of second time units indicated by the second indication information.

[0306] Optionally, in another embodiment, the preset offset threshold is one of 2, 2.5, 5, 7, and 7.5.

[0307] Optionally, in another embodiment, the time domain information of the control channel resource set includes a time domain position of the control channel resource set in the third time unit; and the fifth indication information used to indicate the starting time domain position of the RO in the third time unit is determined based on a time domain position of the control channel resource set in the third time unit, and the starting time domain position of the RO in the third time unit is after a time domain position of a preset control channel resource set in the third time unit; or the starting time domain position that is of the RO in the third time unit and that is indicated by the fifth indication information is a starting time domain position of the third time unit or a preset time domain position in the third time unit.

[0308] Optionally, in another embodiment, the starting time domain position of the RO indicates a position, in the third time unit, of the first fourth time unit in at least one fourth time unit that is in the third time unit and that is occupied by the RO; and when the starting time domain position of the RO in the third time unit is after a time domain position of the last control channel resource set in the third time unit, a value of a sequence number of the fourth time unit corresponding to the starting time domain position of the RO in the third time unit is one of the following three: one time a time domain length of the control channel resource set in the third time unit; twice the time domain length of the control channel resource set in the third time unit; and a sum of a sequence number of a starting fourth time unit in the control channel resource set in the third time unit and one time the time domain length of the control channel resource set.

[0309] Optionally, in another embodiment, the fourth indication information used to indicate the quantity of ROs in the third time unit is determined based on the starting time domain position of the RO in the third time unit and a length of a time domain resource occupied by the preamble sequence.

[0310] Optionally, in another embodiment, the quantity that is of ROs in the third time unit and that is indicated by the fourth indication information is less than or equal to a ratio of a length of a time domain resource between the starting time domain position of the RO and an ending time domain position of the third time unit to the length of the time domain resource occupied by the preamble sequence.

[0311] Optionally, in another embodiment, the first time unit is a system frame; the second time unit is a subframe or is of 0.25 ms; and the third time unit is a slot.

[0312] Optionally, in another embodiment, the transceiver unit is further configured to send a preamble sequence on the time domain resource for the at least one RO that is configured by using the first configuration information.

[0313] Optionally, in another embodiment, when time domain resources for one or more ROs in the time domain resource for the at least one RO conflict with a time domain resource for the common signal block or a time domain resource for the control channel resource set, the transceiver unit is further configured to skip sending the preamble sequence on the time domain resources for the one or more ROs that conflict with the time domain resource for the common signal block or the time domain resource for the control channel resource set.

[0314] Optionally, in another embodiment, when time domain resources for one or more ROs in the time domain resource for the at least one RO are located on a non-uplink resource in a semi-static uplink/downlink configuration, the transceiver unit is further configured to send a preamble sequence on the time domain resource for the at least one RO that is configured by using the first configuration information.

[0315] Alternatively, in another implementation, the transceiver unit is configured to receive index indication information, where the index indication information is used to indicate a first configuration index; and the processing unit is configured to: determine, based on the first configuration index, first configuration information corresponding to the first configuration index, where the first configuration information is used to indicate a time domain resource for a first group of random access preamble occasions ROs or a time domain resource for a second group of ROs; the time domain resource for the first group of ROs and the time domain resource for the second group of ROs are located in a first time unit in a random access configuration period; and the time domain resource for the first group of ROs or the time domain resource for the second group of ROs is determined based on a time domain offset of the control channel resource set and/or an index of the first time unit; and determine a time domain resource for one group of ROs, where the time domain resource for the group of ROs is the time domain resource for the first group of ROs or the time domain resource for the second group of ROs.

[0316] Therefore, in this embodiment of this application, the time domain resource for the RO is determined based on the time domain offset of the control channel resource set and/or the index of the first time unit, thereby reducing a probability that the resource for the RO collides with a downlink resource (for example, an SSB and/or an RMSI CORE-SET), increasing a quantity of valid ROs in a PRACH configuration period, and improving random access efficiency of the terminal device.

[0317] Optionally, in another embodiment, the first configuration information includes at least one of the following information: first indication information used to indicate the first time unit in the random access configuration period; second indication information used to indicate at least one second time unit in the first time unit, where the at least one second time unit includes a first group of second time units and a second group of second time units, the time domain resource for the first group of ROs belongs to the first group of second time units, and the time domain resource for the second group of ROs belongs to the second group of second time units; third indication information used to indicate a quantity of third time units included in each second time unit in the first group of second time units and the second group

of second time units; fourth indication information used to indicate a quantity of ROs in the third time unit; and fifth indication information used to indicate a starting time domain position of an RO in the third time unit.

[0318] Optionally, in another embodiment, the random access configuration period is greater than a preset duration threshold, and the time domain offset of the control channel resource set indicates duration between a starting time domain position of a control channel resource set associated with the first common signal block in the common signal block detection window and a starting position of a system frame in which the control channel resource set is located; and the first indication information used to indicate the first time unit is determined based on the time domain offset of the control channel resource set.

[0319] Optionally, in another embodiment, when the time domain offset of the control channel resource set is greater than or equal to a preset offset threshold, a sequence number corresponding to a position of the first time unit indicated by the first indication information in the random access configuration period is an even number; or when the time domain offset of the control channel resource set is less than the preset offset threshold, a sequence number corresponding to a position of the first time unit indicated by the first indication information in the random access configuration period is an odd number.

[0320] Optionally, in another embodiment, the second indication information used to indicate the at least one second time unit is determined based on a time domain position of the common signal block.

[0321] Optionally, in another embodiment, the at least one second time unit indicated by the second indication information is located at a time domain position other than an optional time domain position of the common signal block in the first time unit.

[0322] Optionally, in another embodiment, the second indication information used to indicate the at least one second time unit is determined based on an optional time domain position of the common signal block and/or the index of the first time unit.

[0323] Optionally, in another embodiment, the first group of second time units is located at a time domain position other than an optional time domain position of the common signal block in the first half time domain part of the first time unit; the second group of second time units is located at a time domain position other than an optional time domain position of the common signal block in the second half time domain part of the first time unit; and the processing unit is specifically configured to determine the time domain resource for the group of ROs based on the index of the first time unit, where when the index of the first time unit is an even number, the time domain resource for the group of ROs that is determined by the processing unit is the time domain resource for the first group of ROs; or when the index of the first time unit is an odd number, the time domain resource for the group of ROs that is determined by the processing unit is the time domain resource for the second group of ROs.

[0324] Optionally, in another embodiment, the preset offset threshold is one of 2, 2.5, 5, 7, and 7.5.

[0325] Optionally, in another embodiment, the fifth indication information used to indicate the starting time domain position of the RO in the third time unit is determined based on a time domain position of the control channel resource set in the third time unit, and the starting time domain position of the RO in the third time unit is after a time domain position of a preset control channel resource set in the third time unit; or the starting time domain position that is of the RO in the third time unit and that is indicated by the fifth indication information is a starting time domain position of the third time unit or a preset time domain position in the third time unit.

[0326] Optionally, in another embodiment, the starting time domain position of the RO indicates a position, in the third time unit, of the first fourth time unit in at least one fourth time unit that is in the third time unit and that is occupied by the RO; and when the starting time domain position of the RO in the third time unit is after a time domain position of the last control channel resource set in the third time unit, a value of a sequence number of the fourth time unit corresponding to the starting time domain position of the RO in the third time unit is one of the following three: one time a time domain length of the control channel resource set in the third time unit; twice the time domain length of the control channel resource set in the third time unit; and a sum of a sequence number of a starting fourth time unit in the control channel resource set in the third time unit and one time the time domain length of the control channel resource set.

[0327] Optionally, in another embodiment, the fourth indication information used to indicate the quantity of ROs in the third time unit is determined based on the starting time domain position of the RO in the third time unit and a length of a time domain resource occupied by the preamble sequence.

[0328] Optionally, in another embodiment, the quantity that is of ROs in the third time unit and that is indicated by the fourth indication information is less than or equal to a ratio of a length of a time domain resource between the starting time domain position of the RO and an ending time domain position of the third time unit to the length of the time domain resource occupied by the preamble sequence.

[0329] Optionally, in another embodiment, the first time unit is a system frame; the second time unit is a subframe or is of 0.25 ms; and the third time unit is a slot.

[0330] Optionally, in another embodiment, the transceiver unit is further configured to send a preamble sequence on the determined time domain resource for the group of ROs.

[0331] Optionally, in another embodiment, when time domain resources for one or more ROs in the time domain

resource for the group of ROs conflict with a time domain resource for the common signal block or a time domain resource for the control channel resource set, the transceiver unit is further configured to skip sending the preamble sequence on the time domain resources for the one or more ROs that conflict with the time domain resource for the common signal block or the time domain resource for the control channel resource set.

[0332] Optionally, in another embodiment, when time domain resources for one or more ROs in the time domain resource for the group of ROs are located on a non-uplink resource in a semi-static uplink/downlink configuration, the transceiver unit is further configured to send a preamble sequence on the determined time domain resource for the group of ROs.

[0333] Alternatively, in another implementation, the transceiver unit is configured to receive index indication information, where the index indication information is used to indicate a first configuration index; the processing unit is configured to determine, based on the first configuration index, a time domain resource for at least one random access preamble occasion RO corresponding to the first configuration index; and when it is determined that time domain resources for one or more ROs in the time domain resource for the at least one RO conflict with a time domain resource for a common signal block or a time domain resource for a control channel resource set, the transceiver unit is further configured to skip sending the preamble sequence on the time domain resources for the one or more ROs that conflict with the time domain resource for the common signal block or the time domain resource for the control channel resource set; or when it is determined that time domain resources for one or more ROs in the time domain resource for the at least one RO are located on a non-uplink resource in a semi-static uplink/downlink configuration, the transceiver unit is further configured to send a preamble sequence on the time domain resource for the at least one RO.

[0334] Therefore, in this embodiment of this application, when a resource conflict exists, a preamble sequence is not sent on a conflicting resource, thereby avoiding unnecessary and useless work, and avoiding a random access failure. In addition, in this embodiment of this application, the preamble sequence is still sent when a selected time domain resource for one group of ROs does not match the semi-static uplink/downlink configuration, thereby improving a success rate of random access.

[0335] It should be understood that, the terminal device 900 shown in FIG. 9 can implement various processes of the terminal device in the method embodiments in FIG. 1 to FIG. 8. Operations and/or functions of the modules in the terminal device 900 are respectively for implementing corresponding procedures in the foregoing method embodiments. For details, refer to the descriptions in the foregoing method embodiments. To avoid repetition, detailed descriptions are appropriately omitted herein.

[0336] FIG. 10 is a schematic block diagram of a network device according to an embodiment of this application. Specifically, the network device shown in FIG. 10 may be applied to the system shown in FIG. 1, and perform functions of the network device in the foregoing method embodiments.

[0337] The network device 1000 shown in FIG. 10 includes a processing unit 1010 and a transceiver unit 1020.

[0338] In an implementation, the processing unit is configured to generate index indication information, where the index indication information is used to indicate a first configuration index; and the transceiver unit is configured to send the index indication information to a terminal device, where the index indication information is used by the terminal device to determine, based on the first configuration index, first configuration information corresponding to the first configuration index; the first configuration information is used to indicate a time domain resource for at least one random access preamble occasion RO; and the first configuration information is determined based on a time domain resource for a common signal block and/or time domain information of a control channel resource set.

[0339] Therefore, in this embodiment of this application, the time domain resource for the RO is determined based on the time domain resource for the common signal block and/or the time domain information of the control channel resource set, thereby reducing a probability that the resource for the RO collides with a downlink resource (for example, an SSB and/or an RMSI CORESET), increasing a quantity of valid ROs in a PRACH configuration period, and improving random access efficiency of the terminal device.

[0340] Optionally, in another embodiment, the first configuration information includes at least one of the following information: first indication information used to indicate a first time unit in a random access configuration period; second indication information used to indicate at least one second time unit in the first time unit; third indication information used to indicate a quantity of third time units included in each of the at least one second time unit; fourth indication information used to indicate a quantity of ROs in the third time unit; and fifth indication information used to indicate a starting time domain position of an RO in the third time unit.

[0341] Optionally, in another embodiment, the random access configuration period is greater than a preset duration threshold, the time domain information of the control channel resource set includes a time domain offset of the control channel resource set, and the time domain offset of the control channel resource set indicates duration between a starting time domain position of a control channel resource set associated with the first common signal block in the common signal block detection window and a starting position of a system frame in which the control channel resource set is located; and the first indication information used to indicate the first time unit is determined based on the time domain offset of the control channel resource set.

[0342] Optionally, in another embodiment, when the time domain offset of the control channel resource set is greater than or equal to a preset offset threshold, a sequence number corresponding to a position of the first time unit indicated by the first indication information in the random access configuration period is an even number; or when the time domain offset of the control channel resource set is less than the preset offset threshold, a sequence number corresponding to a position of the first time unit indicated by the first indication information in the random access configuration period is an odd number.

[0343] Optionally, in another embodiment, the second indication information used to indicate the at least one second time unit is determined based on a time domain position of the common signal block.

[0344] Optionally, in another embodiment, the at least one second time unit indicated by the second indication information is located at a time domain position other than an optional time domain position of the common signal block in the first time unit.

[0345] Optionally, in another embodiment, the second indication information used to indicate the at least one second time unit is determined based on an optional time domain position of the common signal block and/or an index of the first time unit.

[0346] Optionally, in another embodiment, the at least one second time unit includes a first group of second time units and a second group of second time units; the first group of second time units is located at a time domain position other than an optional time domain position of the common signal block in the first half time domain part of the first time unit; the second group of second time units is located at a time domain position other than an optional time domain position of the common signal block in the second half time domain part of the first time unit; and when the index of the first time unit is an even number, the time domain resource for the at least one random access preamble occasion RO belongs to the first group of second time units indicated by the second indication information; or when the index of the first time unit is an odd number, the time domain resource for the at least one random access preamble occasion RO belongs to the second group of second time units indicated by the second indication information.

[0347] Optionally, in another embodiment, the preset offset threshold is one of 2, 2.5, 5, 7, and 7.5.

[0348] Optionally, in another embodiment, the time domain information of the control channel resource set includes a time domain position of the control channel resource set in the third time unit; and the fifth indication information used to indicate the starting time domain position of the RO in the third time unit is determined based on a time domain position of the control channel resource set in the third time unit, and the starting time domain position of the RO in the third time unit is after a time domain position of a preset control channel resource set in the third time unit; or the starting time domain position that is of the RO in the third time unit and that is indicated by the fifth indication information is a starting time domain position of the third time unit or a preset time domain position in the third time unit.

[0349] Optionally, in another embodiment, the starting time domain position of the RO indicates a position, in the third time unit, of the first fourth time unit in at least one fourth time unit that is in the third time unit and that is occupied by the RO; and when the starting time domain position of the RO in the third time unit is after a time domain position of the last control channel resource set in the third time unit, a value of a sequence number of the fourth time unit corresponding to the starting time domain position of the RO in the third time unit is one of the following three: one time a time domain length of the control channel resource set in the third time unit; twice the time domain length of the control channel resource set in the third time unit; and a sum of a sequence number of a starting fourth time unit in the control channel resource set in the third time unit and one time the time domain length of the control channel resource set.

[0350] Optionally, in another embodiment, the fourth indication information used to indicate the quantity of ROs in the third time unit is determined based on the starting time domain position of the RO in the third time unit and a length of a time domain resource occupied by the preamble sequence.

[0351] Optionally, in another embodiment, the quantity that is of ROs in the third time unit and that is indicated by the fourth indication information is less than or equal to a ratio of a length of a time domain resource between the starting time domain position of the RO and an ending time domain position of the third time unit to the length of the time domain resource occupied by the preamble sequence.

[0352] Optionally, in another embodiment, the first time unit is a system frame; the second time unit is a subframe or is of 0.25 ms; and the third time unit is a slot.

[0353] Optionally, in another embodiment, the transceiver unit is further configured to receive, on the time domain resource for the at least one RO that is configured by using the first configuration information, a preamble sequence sent by the terminal device.

[0354] Optionally, in another embodiment, when time domain resources for one or more ROs in the time domain resource for the at least one RO conflict with a time domain resource for the common signal block or a time domain resource for the control channel resource set, the transceiver unit is further configured to skip receiving the preamble sequence on the time domain resources for the one or more ROs that conflict with the time domain resource for the common signal block or the time domain resource for the control channel resource set.

[0355] Optionally, in another embodiment, when time domain resources for one or more ROs in the time domain resource for the at least one RO are located on a non-uplink resource in a semi-static uplink/downlink configuration, the

transceiver unit is further configured to receive, on the time domain resource for the at least one RO that is configured by using the first configuration information, a preamble sequence sent by the terminal device.

[0356] Alternatively, in another implementation, the processing unit is configured to generate index indication information, where the index indication information is used to indicate a first configuration index; and the transceiver unit is configured to send index indication information to a terminal device, where the index indication information is used by the terminal device to determine, based on the first configuration index, first configuration information corresponding to the first configuration index; the first configuration information is used to indicate a time domain resource for a first group of random access preamble occasions ROs or a time domain resource for a second group of ROs, so that the terminal device determines a time domain resource for one group of ROs; the time domain resource for the group of ROs is the time domain resource for the first group of ROs or the time domain resource for the second group of ROs; the time domain resource for the first group of ROs and the time domain resource for the second group of ROs are located in a first time unit in a random access configuration period; and the time domain resource for the first group of ROs or the time domain resource for the second group of ROs is determined based on a time domain offset of the control channel resource set and/or an index of the first time unit.

[0357] Therefore, in this embodiment of this application, the time domain resource for the RO is determined based on the time domain offset of the control channel resource set and/or the index of the first time unit, thereby reducing a probability that the resource for the RO collides with a downlink resource (for example, an SSB and/or an RMSI CORE-SET), increasing a quantity of valid ROs in a PRACH configuration period, and improving random access efficiency of the terminal device.

[0358] Optionally, in another embodiment, the first configuration information includes at least one of the following information: first indication information used to indicate the first time unit in the random access configuration period; second indication information used to indicate at least one second time unit in the first time unit, where the at least one second time unit includes a first group of second time units and a second group of second time units, the time domain resource for the first group of ROs belongs to the first group of second time units, and the time domain resource for the second group of ROs belongs to the second group of second time units; third indication information used to indicate a quantity of third time units included in each second time unit in the first group of second time units and the second group of second time units; fourth indication information used to indicate a quantity of ROs in the third time unit; and fifth indication information used to indicate a starting time domain position of an RO in the third time unit.

[0359] Optionally, in another embodiment, the random access configuration period is greater than a preset duration threshold, and the time domain offset of the control channel resource set indicates duration between a starting time domain position of a control channel resource set associated with the first common signal block in the common signal block detection window and a starting position of a system frame in which the control channel resource set is located; and the first indication information used to indicate the first time unit is determined based on the time domain offset of the control channel resource set.

[0360] Optionally, in another embodiment, when the time domain offset of the control channel resource set is greater than or equal to a preset offset threshold, a sequence number corresponding to a position of the first time unit indicated by the first indication information in the random access configuration period is an even number; or when the time domain offset of the control channel resource set is less than the preset offset threshold, a sequence number corresponding to a position of the first time unit indicated by the first indication information in the random access configuration period is an odd number.

[0361] Optionally, in another embodiment, the second indication information used to indicate the at least one second time unit is determined based on a time domain position of the common signal block.

[0362] Optionally, in another embodiment, the at least one second time unit indicated by the second indication information is located at a time domain position other than an optional time domain position of the common signal block in the first time unit.

[0363] Optionally, in another embodiment, the second indication information used to indicate the at least one second time unit is determined based on an optional time domain position of the common signal block and/or the index of the first time unit.

[0364] Optionally, in another embodiment, the first group of second time units is located at a time domain position other than an optional time domain position of the common signal block in the first half time domain part of the first time unit; and the second group of second time units is located at a time domain position other than an optional time domain position of the common signal block in the second half time domain part of the first time unit.

[0365] Optionally, in another embodiment, the preset offset threshold is one of 2, 2.5, 5, 7, and 7.5.

[0366] Optionally, in another embodiment, the fifth indication information used to indicate the starting time domain position of the RO in the third time unit is determined based on a time domain position of the control channel resource set in the third time unit, and the starting time domain position of the RO in the third time unit is after a time domain position of a preset control channel resource set in the third time unit; or the starting time domain position that is of the RO in the third time unit and that is indicated by the fifth indication information is a starting time domain position of the

third time unit or a preset time domain position in the third time unit.

[0367] Optionally, in another embodiment, the starting time domain position of the RO indicates a position, in the third time unit, of the first fourth time unit in at least one fourth time unit that is in the third time unit and that is occupied by the RO; and when the starting time domain position of the RO in the third time unit is after a time domain position of the last control channel resource set in the third time unit, a value of a sequence number of the fourth time unit corresponding to the starting time domain position of the RO in the third time unit is one of the following three: one time a time domain length of the control channel resource set in the third time unit; twice the time domain length of the control channel resource set in the third time unit; and a sum of a sequence number of a starting fourth time unit in the control channel resource set in the third time unit and one time the time domain length of the control channel resource set.

[0368] Optionally, in another embodiment, the fourth indication information used to indicate the quantity of ROs in the third time unit is determined based on the starting time domain position of the RO in the third time unit and a length of a time domain resource occupied by the preamble sequence.

[0369] Optionally, in another embodiment, the quantity that is of ROs in the third time unit and that is indicated by the fourth indication information is less than or equal to a ratio of a length of a time domain resource between the starting time domain position of the RO and an ending time domain position of the third time unit to the length of the time domain resource occupied by the preamble sequence.

[0370] Optionally, in another embodiment, the first time unit is a system frame; the second time unit is a subframe or is of 0.25 ms; and the third time unit is a slot.

[0371] Optionally, in another embodiment, the transceiver unit is further configured to receive a preamble sequence that is sent by the terminal device on the determined time domain resource for the group of ROs.

[0372] Optionally, in another embodiment, when time domain resources for one or more ROs in the time domain resource for the group of ROs that is determined by the terminal device conflict with a time domain resource for the common signal block or a time domain resource for the control channel resource set, the transceiver unit is further configured to skip receiving the preamble sequence on the time domain resources for the one or more ROs that conflict with the time domain resource for the common signal block or the time domain resource for the control channel resource set.

[0373] Optionally, in another embodiment, when time domain resources for one or more ROs in the time domain resource for the group of ROs that is determined by the terminal device are located on a non-uplink resource in a semi-static uplink/downlink configuration, the transceiver unit is further configured to receive a preamble sequence that is sent by the terminal device on the determined time domain resource for the group of ROs.

[0374] Alternatively, in another implementation, the processing unit is configured to generate index indication information, where the index indication information is used to indicate a first configuration index; the transceiver unit sends the index indication information to a terminal device, where the index indication information is used by the terminal device to determine, based on the first configuration index, a time domain resource for at least one random access preamble occasion RO corresponding to the first configuration index; and when it is determined that time domain resources for one or more ROs in the time domain resource for the at least one RO conflict with a time domain resource for a common signal block or a time domain resource for a control channel resource set, the transceiver unit is further configured to skip receiving the preamble sequence on the time domain resources for the one or more ROs that conflict with the time domain resource for the common signal block or the time domain resource for the control channel resource set; or when it is determined that time domain resources for one or more ROs in the time domain resource for the at least one RO are located on a non-uplink resource in a semi-static uplink/downlink configuration, the transceiver unit is further configured to receive, on the time domain resource for the at least one RO that is configured by using the first configuration information, a preamble sequence sent by the terminal device.

[0375] Therefore, in this embodiment of this application, when a resource conflict exists, a preamble sequence is not sent on a conflicting resource, thereby avoiding unnecessary and useless work, and avoiding a random access failure. In addition, in this embodiment of this application, the preamble sequence is still sent when a selected time domain resource for one group of ROs does not match the semi-static uplink/downlink configuration, thereby improving a success rate of random access.

[0376] It should be understood that, the network device 1000 shown in FIG. 10 can implement various processes of the network device in the method embodiments in FIG. 1 to FIG. 8. Operations and/or functions of the modules in the network device 1000 are respectively for implementing corresponding procedures in the foregoing method embodiments. For details, refer to the descriptions in the foregoing method embodiments. To avoid repetition, detailed descriptions are appropriately omitted herein.

[0377] FIG. 11 is a schematic block diagram of a terminal device according to another embodiment of this application. Specifically, the terminal device shown in FIG. 11 may be applied to the system shown in FIG. 1, and perform functions of the terminal device in the foregoing method embodiments.

[0378] Specifically, as shown in FIG. 11, the terminal device 1100 includes a processor 1110 and a transceiver 1120. The processor 1110 is connected to the transceiver 1120. Optionally, the terminal device may further include a memory

1130. The processor 1110 is connected to the memory 1130. The processor 1110, the transceiver 1120, and the memory 1130 communicate with each other through an internal connection path, to transfer a control and/or data signal.

[0379] The transceiver 1120 may be an antenna or a control circuit that has receiving and sending functions. The transceiver may include a receiver configured to receive data and a transmitter configured to send data. The memory 1130 may be configured to store an instruction. The processor 1110 is configured to: execute the instruction stored in the memory 1130 and control the transceiver 1120 to receive and send information or a signal. The controller 1110 executes the instruction in the memory 1130, so that the processes of the terminal device in the foregoing method embodiments in FIG. 1 to FIG. 8 can be completed. To avoid repetition, details are not described herein again.

[0380] It should be understood that, the terminal device 1100 may correspond to the terminal device 900 in FIG. 9, the function of the processing unit 910 in the terminal device 900 may be implemented by the processor 1110, and the function of the transceiver unit 920 may be implemented by the transceiver 1120. To avoid repetition, detailed descriptions are appropriately omitted herein.

[0381] FIG. 12 is a schematic block diagram of a network device according to another embodiment of this application. Specifically, the network device shown in FIG. 12 may be applied to the system shown in FIG. 1, and perform functions of the network device in the foregoing method embodiments.

[0382] Specifically, as shown in FIG. 12, the network device 1200 includes a processor 1210 and a transceiver 1220. The processor 1210 is connected to the transceiver 1220. Optionally, the network device may further include a memory 1230. The processor 1210 is connected to the memory 1230. The processor 1210, the transceiver 1220, and the memory 1230 communicate with each other through an internal connection path, to transfer a control and/or data signal.

[0383] The transceiver 1220 may be an antenna or a control circuit that has receiving and sending functions. The transceiver may include a receiver configured to receive data and a transmitter configured to send data. The memory 1230 may be configured to store an instruction. The processor 1210 is configured to: execute the instruction stored in the memory 1230 and control the transceiver 1220 to receive and send information or a signal. The controller 1210 executes the instruction in the memory 1230, so that the processes of the network device in the foregoing method embodiments in FIG. 1 to FIG. 8 can be completed. To avoid repetition, details are not described herein again.

[0384] It should be understood that, the network device 1200 may correspond to the network device 1000 in FIG. 10, the function of the processing unit 1010 in the network device 1000 may be implemented by the processor 1210, and the function of the transceiver unit 1020 may be implemented by the transceiver 1220. To avoid repetition, detailed descriptions are appropriately omitted herein.

[0385] It should be noted that the processor (for example, the processors in FIG. 11 and FIG. 12) in the embodiments of this application may be an integrated circuit chip, and has a signal processing capability. In an implementation process, steps in the foregoing method embodiments can be implemented by using a hardware integrated logical circuit in the processor, or by using instructions in a form of software. The foregoing processor may be a general purpose processor, a digital signal processor (digital signal processor, DSP), an application-specific integrated circuit (application specific integrated circuit, ASIC), a field programmable gate array (field programmable gate array, FPGA) or another programmable logical device, a discrete gate or transistor logic device, or a discrete hardware component. It may implement or perform the methods, the steps, and logical block diagrams that are disclosed in the embodiments of this application. The general purpose processor may be a microprocessor, or the processor may be any conventional processor or the like. Steps of the methods disclosed with reference to the embodiments of this application may be directly executed and accomplished by using a hardware decoding processor, or may be executed and accomplished by using a combination of hardware and software modules in the decoding processor. A software module may be located in a mature storage medium in the art, such as a random access memory, a flash memory, a read-only memory, a programmable read-only memory, an electrically erasable programmable memory, or a register. The storage medium is located in the memory, and the processor reads information in the memory and completes the steps in the foregoing methods in combination with hardware of the processor.

[0386] It may be understood that the memory (for example, the memories in FIG. 11 to FIG. 12) in the embodiments of this application may be a volatile memory or a nonvolatile memory, or may include both a volatile memory and a nonvolatile memory. The nonvolatile memory may be a read-only memory (read-only memory, ROM), a programmable read-only memory (programmable ROM, PROM), an erasable programmable read-only memory (erasable PROM, EPROM), an electrically erasable programmable read-only memory (electrically EPROM, EEPROM), or a flash memory. The volatile memory may be a random access memory (random access memory, RAM), used as an external cache. Through example but not limitative description, many forms of RAMs may be used, for example, a static random access memory (static RAM, SRAM), a dynamic random access memory (dynamic RAM, DRAM), a synchronous dynamic random access memory (synchronous DRAM, SDRAM), a double data rate synchronous dynamic random access memory (double data rate SDRAM, DDR SDRAM), an enhanced synchronous dynamic random access memory (enhanced SDRAM, ESDRAM), a synchronous link dynamic random access memory (synchlink DRAM, SLDRAM), and a direct rambus dynamic random access memory (direct rambus RAM, DR RAM). It should be noted that the memory of the systems and methods described in this specification includes but is not limited to these and any memory of another

proper type.

[0387] An embodiment of this application further provides a processing apparatus, including a processor and an interface. The processor is configured to perform the communication method in any one of the foregoing method embodiments.

[0388] It should be understood that the foregoing processing apparatus may be a chip. For example, the processing apparatus may be a field programmable gate array (field-programmable gate array, FPGA), or an application-specific integrated chip (application specific integrated circuit, ASIC), or may be a system on chip (system on chip, SoC), a central processing unit (central processor unit, CPU), a network processor (network processor, NP), a digital signal processor (digital signal processor, DSP), or a micro controller (micro controller unit, MCU), or may be a programmable logic device (programmable logic device, PLD), or another integrated chip.

[0389] An embodiment of this application further provides a computer-readable medium. The computer-readable medium stores a computer program. When the computer program is executed by a computer, the method in any one of the foregoing method embodiments is implemented.

[0390] An embodiment of this application further provides a computer program product. When the computer program product is executed by a computer, the method in any one of the foregoing method embodiments is implemented.

[0391] All or some of the foregoing embodiments may be implemented by using software, hardware, firmware, or any combination thereof. When software is used to implement the embodiments, the embodiments may be implemented completely or partially in a form of a computer program product. The computer program product includes one or more computer instructions. When the computer instructions are loaded and executed on the computer, the procedures or functions according to the embodiments of this application are all or partially generated. The computer may be a general-purpose computer, a special purpose computer, a computer network, or other programmable apparatuses. The computer instructions may be stored in a computer-readable storage medium or may be transmitted from a computer-readable storage medium to another computer-readable storage medium. For example, the computer instructions may be transmitted from a website, a computer, a server, or a data center to another website, computer, server, or data center in a wired (for example, a coaxial cable, an optical fiber, or a digital subscriber line (digital subscriber line, DSL)) or wireless (for example, infrared, radio, or microwave) manner. The computer-readable storage medium may be any usable medium accessible by a computer, or a data storage device, such as a server or a data center, integrating one or more usable media. The usable medium may be a magnetic medium (for example, a floppy disk, a hard disk, or a magnetic tape), an optical medium (for example, a high-density digital video disc (digital video disc, DVD), a semiconductor medium (for example, a solid-state drive (solid state disk, SSD)), or the like.

[0392] It should be understood that first, second, third, fourth, and various serial numbers in this specification are merely for purpose of distinction for ease of description, but are not intended to limit the scope of the embodiments of this application.

[0393] Terms such as "component", "module", and "system" used in this specification are used to indicate computer-related entities, hardware, firmware, combinations of hardware and software, software, or software being executed. For example, a component may be, but is not limited to, a process that is run on a processor, a processor, an object, an executable file, a thread of execution, a program, and/or a computer. As shown in the figures, both a computing device and an application that is run on a computing device may be components. One or more components may reside within a process and/or a thread of execution, and a component may be located on one computer and/or distributed between two or more computers. In addition, these components may be executed from various computer-readable media that store various data structures. For example, the components may communicate by using a local and/or remote process and according to, for example, a signal having one or more data packets (for example, data from two components interacting with another component in a local system, a distributed system, and/or across a network such as the Internet interacting with other systems by using the signal).

[0394] It should be understood that "one embodiment" or "an embodiment" mentioned in the whole specification does not mean that particular features, structures, or characteristics related to the embodiment are included in at least one embodiment of this application. Therefore, "in one embodiment" or "in an embodiment" appearing throughout the specification does not refer to a same embodiment. In addition, these particular features, structures, or characteristics may be combined in one or more embodiments in any appropriate manner. It should be understood that sequence numbers of the foregoing processes do not mean execution sequences in various embodiments of this application. The execution sequences of the processes should be determined according to functions and internal logic of the processes, and should not be construed as any limitation on the implementation processes of the embodiments of this application.

[0395] In addition, the terms "system" and "network" may be used interchangeably in this specification. The term "and/or" in this specification describes only an association relationship for describing associated objects and represents that three relationships may exist. For example, A and/or B may represent the following three cases: Only A exists, both A and B exist, and only B exists. In addition, the character "/" in this specification generally indicates an "or" relationship between the associated objects.

[0396] It should be understood that in the embodiments of this application, "B corresponding to A" indicates that B is

associated with A, and B may be determined according to A. However, it should be further understood that determining A according to B does not mean that B is determined according to A only, that is, B may also be determined according to A and/or other information.

[0397] A person of ordinary skill in the art may be aware that, in combination with the examples described in the embodiments disclosed in this specification, units and algorithm steps may be implemented by electronic hardware, computer software, or a combination thereof. To clearly describe the interchangeability between the hardware and the software, the foregoing has generally described compositions and steps of each example according to functions. Whether the functions are performed by hardware or software depends on particular applications and design constraint conditions of the technical solutions. A person skilled in the art may use different methods to implement the described functions for each particular application, but it should not be considered that the implementation goes beyond the scope of this application.

[0398] It may be clearly understood by a person skilled in the art that, for the purpose of convenient and brief description, for a detailed working process of the foregoing system, apparatus, and unit, refer to a corresponding process in the foregoing method embodiments, and details are not described herein again.

[0399] In the several embodiments provided in this application, it should be understood that the disclosed system, apparatus, and method may be implemented in other manners. For example, the described apparatus embodiment is merely an example. For example, the unit division is merely logical function division and may be other division in actual implementation. For example, a plurality of units or components may be combined or integrated into another system, or some features may be ignored or not performed. In addition, the displayed or discussed mutual couplings or direct couplings or communication connections may be implemented through some interfaces, indirect couplings or communication connections between the apparatuses or units, or electrical connections, mechanical connections, or connections in other forms.

[0400] The units described as separate parts may or may not be physically separate, and parts displayed as units may or may not be physical units, may be located in one position, or may be distributed on a plurality of network units. Some or all of the units may be selected according to actual requirements to achieve the objectives of the solutions of the embodiments in this application.

[0401] In addition, functional units in the embodiments of this application may be integrated into one processing unit, or each of the units may exist alone physically, or two or more units are integrated into one unit. The integrated unit may be implemented in a form of hardware, or may be implemented in a form of a software functional unit.

[0402] With descriptions of the foregoing implementations, a person skilled in the art may clearly understand that this application may be implemented by hardware, firmware or a combination thereof. When the present invention is implemented by software, the foregoing functions may be stored in a computer-readable medium or transmitted as one or more instructions or code in the computer-readable medium. The computer-readable medium includes a computer storage medium and a communications medium, where the communications medium includes any medium that enables a computer program to be transmitted from one place to another. The storage medium may be any available medium accessible to a computer. The following provides an example but does not impose a limitation: The computer-readable medium may include a RAM, a ROM, an EEPROM, a CD-ROM, or another optical disc storage or a disk storage medium, or another magnetic storage device, or any other medium that can carry or store expected program code in a form of an instruction or a data structure and can be accessed by a computer. In addition, any connection may be appropriately defined as a computer-readable medium. For example, if software is transmitted from a website, a server or another remote source by using a coaxial cable, an optical fiber/cable, a twisted pair, a digital subscriber line (DSL) or wireless technologies such as infrared ray, radio, and microwave, the coaxial cable, optical fiber/cable, twisted pair, DSL or wireless technologies such as infrared ray, radio and microwave are included in fixation of a medium to which they belong. A disk (Disk) and disc (disc) used by this application includes a compact disc (CD), a laser disc, an optical disc, a digital versatile disc (DVD), a floppy disk and a Blu-ray disc, where the disk generally copies data by a magnetic means, and the disc copies data optically by a laser means. The foregoing combination should also be included in the protection scope of the computer-readable medium.

[0403] In conclusion, what is described above is merely preferred embodiments of the technical solutions of this application, but is not intended to limit the protection scope of this application. Any modification, equivalent replacement, or improvement made without departing from the spirit and principle of this application shall fall within the protection scope of this application.

Claims

1. A communication method, comprising:

receiving, by a terminal device, index indication information, wherein the index indication information is used to

indicate a first configuration index;

determining, by the terminal device based on the first configuration index, first configuration information corresponding to the first configuration index, wherein the first configuration information is used to indicate a time domain resource for a first group of random access preamble occasions ROs or a time domain resource for a second group of ROs, and the time domain resource for the first group of ROs and the time domain resource for the second group of ROs are located in a first time unit in a random access configuration period; and determining, by the terminal device, a time domain resource for one group of ROs, wherein the time domain resource for the group of ROs is the time domain resource for the first group of ROs or the time domain resource for the second group of ROs.

2. A communication method, comprising:

generating, by a network device, index indication information, wherein the index indication information is used to indicate a first configuration index; and

sending, by the network device, the index indication information to a terminal device, wherein the index indication information is used by the terminal device to determine, based on the first configuration index, first configuration information corresponding to the first configuration index; the first configuration information is used to indicate a time domain resource for a first group of random access preamble occasions ROs or a time domain resource for a second group of ROs, so that the terminal device determines a time domain resource for one group of ROs; the time domain resource for the group of ROs is the time domain resource for the first group of ROs or the time domain resource for the second group of ROs; and the time domain resource for the first group of ROs and the time domain resource for the second group of ROs are located in a first time unit in a random access configuration period.

3. An apparatus, comprising:

a processing unit and a transceiver unit, wherein

the transceiver unit is configured to receive index indication information, wherein the index indication information is used to indicate a first configuration index;

the processing unit is configured to determine, based on the first configuration index, first configuration information corresponding to the first configuration index, wherein the first configuration information is used to indicate a time domain resource for a first group of random access preamble occasions ROs or a time domain resource for a second group of ROs, and the time domain resource for the first group of ROs and the time domain resource for the second group of ROs are located in a first time unit in a random access configuration period; and

the processing unit is configured to determine a time domain resource for one group of ROs, wherein the time domain resource for the group of ROs is the time domain resource for the first group of ROs or the time domain resource for the second group of ROs.

4. An apparatus, comprising:

a processing unit and a transceiver unit, wherein

the processing unit is configured to generate index indication information, wherein the index indication information is used to indicate a first configuration index; and

the transceiver unit is configured to send the index indication information to a terminal device, wherein the index indication information is used by the terminal device to determine, based on the first configuration index, first configuration information corresponding to the first configuration index; the first configuration information is used to indicate a time domain resource for a first group of random access preamble occasions ROs or a time domain resource for a second group of ROs, so that the terminal device determines a time domain resource for one group of ROs; the time domain resource for the group of ROs is the time domain resource for the first group of ROs or the time domain resource for the second group of ROs; and the time domain resource for the first group of ROs and the time domain resource for the second group of ROs are located in a first time unit in a random access configuration period.

5. The method according to claim 1 or 2, or the apparatus according to claim 3 or 4, wherein the first configuration information comprises at least one of the following information:

first indication information used to indicate the first time unit in the random access configuration period;

second indication information used to indicate at least one second time unit in the first time unit, wherein the at

least one second time unit comprises a first group of second time units and a second group of second time units, the time domain resource for the first group of ROs belongs to the first group of second time units, and the time domain resource for the second group of ROs belongs to the second group of second time units;
 third indication information used to indicate a quantity of third time units comprised in each second time unit in the first group of second time units and the second group of second time units;
 fourth indication information used to indicate a quantity of ROs in the third time unit; and
 fifth indication information used to indicate a starting time domain position of an RO in the third time unit.

6. The method according to claim 5, or the apparatus according to claim 5, wherein the random access configuration period is greater than a preset duration threshold, and a time domain offset of the control channel resource set indicates duration between a starting time domain position of a control channel resource set associated with the first common signal block in the common signal block detection window and a starting position of a system frame in which the control channel resource set is located; and the first indication information used to indicate the first time unit is determined based on the time domain offset of the control channel resource set.
7. The method according to claim 6, or the apparatus according to claim 6, wherein when the time domain offset of the control channel resource set is greater than or equal to a preset offset threshold, a sequence number corresponding to a position of the first time unit indicated by the first indication information in the random access configuration period is an even number; or
 when the time domain offset of the control channel resource set is less than the preset offset threshold, a sequence number corresponding to a position of the first time unit indicated by the first indication information in the random access configuration period is an odd number.
8. The method according to any one of claims 5 to 7, or the apparatus according to any one of claims 5 to 7, wherein the second indication information used to indicate the at least one second time unit is determined based on a time domain position of the common signal block.
9. The method according to claim 8, or the apparatus according to claim 8, wherein the at least one second time unit indicated by the second indication information is located at a time domain position other than an optional time domain position of the common signal block in the first time unit.
10. The method according to any one of claims 5 to 7, or the apparatus according to any one of claims 5 to 7, wherein the second indication information used to indicate the at least one second time unit is determined based on an optional time domain position of the common signal block and/or an index of the first time unit.
11. The method according to claim 10, or the apparatus according to claim 10, wherein the first group of second time units is located at a time domain position other than an optional time domain position of the common signal block in the first half time domain part of the first time unit;
 the second group of second time units is located at a time domain position other than an optional time domain position of the common signal block in the second half time domain part of the first time unit; and
 the determining, by the terminal device, a time domain resource for one group of ROs comprises:
 determining, by the terminal device, the time domain resource for the group of ROs based on the index of the first time unit, wherein when the index of the first time unit is an even number, the time domain resource for the group of ROs that is determined by the terminal device is the time domain resource for the first group of ROs; or when the index of the first time unit is an odd number, the time domain resource for the group of ROs that is determined by the terminal device is the time domain resource for the second group of ROs.
12. The method according to claim 7 or 11, or the apparatus according to claim 7 or 11, wherein the preset offset threshold is one of 2, 2.5, 5, 7, and 7.5.
13. The method according to any one of claims 5 to 12, or the apparatus according to any one of claims 5 to 12, wherein the fifth indication information used to indicate the starting time domain position of the RO in the third time unit is determined based on a time domain position of the control channel resource set in the third time unit, and the starting time domain position of the RO in the third time unit is after a time domain position of a preset control channel resource set in the third time unit; or
 the starting time domain position that is of the RO in the third time unit and that is indicated by the fifth indication information is a starting time domain position of the third time unit or a preset time domain position in the third time unit.

14. The method according to claim 13, or the apparatus according to claim 13, wherein the starting time domain position of the RO indicates a position, in the third time unit, of the first fourth time unit in at least one fourth time unit that is in the third time unit and that is occupied by the RO; and
 when the starting time domain position of the RO in the third time unit is after a time domain position of the last control channel resource set in the third time unit, a value of a sequence number of the fourth time unit, namely, an OFDM symbol corresponding to the starting time domain position of the RO in the third time unit is one of the following three:

one time a time domain length of the control channel resource set in the third time unit; twice the time domain length of the control channel resource set in the third time unit; and
 a sum of a sequence number of a starting fourth time unit in the control channel resource set in the third time unit and one time the time domain length of the control channel resource set.

15. The method according to any one of claims 5 to 14, or the apparatus according to any one of claims 5 to 14, wherein the fourth indication information used to indicate the quantity of ROs in the third time unit is determined based on the starting time domain position of the RO in the third time unit and a length of a time domain resource occupied by the preamble sequence.

16. The method according to claim 15, or the apparatus according to claim 15, wherein the quantity that is of ROs in the third time unit and that is indicated by the fourth indication information is less than or equal to a ratio of a length of a time domain resource between the starting time domain position of the RO and an ending time domain position of the third time unit to the length of the time domain resource occupied by the preamble sequence.

17. The method according to any one of claims 5 to 16, or the apparatus according to any one of claims 5 to 16, wherein the first time unit is a system frame;
 the second time unit is a subframe or is of 0.25 ms; and
 the third time unit is a slot.

18. The method according to any one of claims 1, and 5 to 17, wherein the method further comprises:
 sending, by the terminal device, a preamble sequence on the determined time domain resource for the group of ROs.

19. The method according to any one of claims 1, and 5 to 17, wherein when time domain resources for one or more ROs in the time domain resource for the group of ROs that is determined by the terminal device conflict with a time domain resource for the common signal block or a time domain resource for the control channel resource set, the method further comprises:
 skipping, by the terminal device, sending the preamble sequence on the time domain resources for the one or more ROs that conflict with the time domain resource for the common signal block or the time domain resource for the control channel resource set.

20. The method according to any one of claims 1, and 5 to 17, wherein when time domain resources for one or more ROs in the time domain resource for the group of ROs that is determined by the terminal device are located on a non-uplink resource in a semi-static uplink/downlink configuration, the method further comprises:
 sending, by the terminal device, a preamble sequence on the determined time domain resource for the group of ROs.

21. The method according to any one of claims 2, and 5 to 17, wherein the method further comprises:
 receiving, by the network device, a preamble sequence that is sent by the terminal device on the determined time domain resource for the group of ROs.

22. The method according to any one of claims 2, and 5 to 17, wherein when time domain resources for one or more ROs in the time domain resource for the group of ROs that is determined by the terminal device conflict with a time domain resource for the common signal block or a time domain resource for the control channel resource set, the method further comprises:
 skipping, by the network device, receiving the preamble sequence on the time domain resources for the one or more ROs that conflict with the time domain resource for the common signal block or the time domain resource for the control channel resource set.

23. The method according to any one of claims 2, and 5 to 17, wherein when time domain resources for one or more ROs in the time domain resource for the group of ROs that is determined by the terminal device are located on a

non-uplink resource in a semi-static uplink/downlink configuration, the method further comprises:
receiving, by the network device, a preamble sequence that is sent by the terminal device on the determined time domain resource for the group of ROs.

- 5 **24.** The apparatus according to any one of claims 3, and 5 to 17, wherein the transceiver unit is further configured to send a preamble sequence on the determined time domain resource for the group of ROs.
- 10 **25.** The apparatus according to any one of claims 3, and 5 to 17, wherein when time domain resources for one or more ROs in the time domain resource for the group of ROs conflict with a time domain resource for the common signal block or a time domain resource for the control channel resource set, the transceiver unit is further configured to skip sending the preamble sequence on the time domain resources for the one or more ROs that conflict with the time domain resource for the common signal block or the time domain resource for the control channel resource set.
- 15 **26.** The apparatus according to any one of claims 3, and 5 to 17, wherein when time domain resources for one or more ROs in the time domain resource for the group of ROs are located on a non-uplink resource in a semi-static uplink/downlink configuration, the transceiver unit is further configured to send a preamble sequence on the determined time domain resource for the group of ROs.
- 20 **27.** The apparatus according to any one of claims 4 to 17, wherein the transceiver unit is further configured to receive a preamble sequence that is sent by the terminal device on the determined time domain resource for the group of ROs.
- 25 **28.** The apparatus according to any one of claims 4 to 17, wherein when time domain resources for one or more ROs in the time domain resource for the group of ROs conflict with a time domain resource for the common signal block or a time domain resource for the control channel resource set, the transceiver unit is further configured to skip receiving the preamble sequence on the time domain resources for the one or more ROs that conflict with the time domain resource for the common signal block or the time domain resource for the control channel resource set.
- 30 **29.** The apparatus according to any one of claims 4 to 17, wherein when time domain resources for one or more ROs in the time domain resource for the group of ROs are located on a non-uplink resource in a semi-static uplink/downlink configuration, the transceiver unit is further configured to receive a preamble sequence that is sent by the terminal device on the determined time domain resource for the group of ROs.
- 35 **30.** The method according to claim 1 or 2, or the apparatus according to claim 3 or 4, wherein the time domain resource for the first group of ROs or the time domain resource for the second group of ROs is determined based on a time domain offset of the control channel resource set and/or an index of the first time unit.
- 40 **31.** A communication method, comprising:
receiving, by a terminal device, index indication information; and
determining, by the terminal device, first configuration information based on the index indication information, wherein the first configuration information is used to indicate a time domain resource for at least one random access preamble occasion RO; the time domain resource comprises the first OFDM symbol occupied by the RO in a slot or a subframe; and a sequence number of the first OFDM symbol in the slot or the subframe is twice a time domain length of a control channel resource set in the slot or the subframe, or is a sum of a sequence number of the first OFDM symbol in a control channel resource set in the slot or the subframe and one time a time domain length of the control channel resource set.
- 45 **32.** A communication method, comprising:
50 generating, by a network device, index indication information; and
sending, by the network device, the index indication information to a terminal device, wherein the index indication information is used by the terminal device to determine first configuration information based on the index indication information; the first configuration information is used to indicate a time domain resource for at least one random access preamble occasion RO; the time domain resource comprises the first OFDM symbol occupied by the RO in a slot or a subframe; and a sequence number of the first OFDM symbol in the slot or the subframe is twice a time domain length of a control channel resource set in the slot or the subframe, or is a sum of a sequence number of the first OFDM symbol in the control channel resource set in the slot or the subframe and one time a time domain length of the control channel resource set.
- 55

33. The method according to claim 31 or 32, wherein the sequence number of the first OFDM symbol in the slot is 2, 6, 8, or 9.
- 5 34. The method according to claim 31 or 32, wherein the first OFDM symbol is located at a starting time domain position of the slot or the subframe.
35. The method according to any one of claims 31 to 34, wherein the first configuration information is determined based on time domain information of the control channel resource set.
- 10 36. The method according to any one of claims 31 to 35, wherein the first OFDM symbol is located after a time domain position of a preset control channel resource set in the slot or the subframe.
37. The method according to any one of claims 31 to 36, wherein the first OFDM symbol is located at a preset time domain position in the slot or the subframe.
- 15 38. The method according to any one of claim 31 or claims 33 to 37, wherein skipping, by the terminal device, sending a preamble sequence on time domain resources for one or more ROs that conflict with a time domain resource for a common signal block.
- 20 39. The method according to any one of claims 32 to 37, wherein skipping, by the network device, receiving a preamble sequence on time domain resources for one or more ROs that conflict with a time domain resource for a common signal block.
- 25 40. The method according to any one of claims 31 to 39, wherein the index indication information is a PRACH configuration index.
41. The method according to any one of claims 31 to 40, wherein the slot is a PRACH slot.
- 30 42. The method according to any one of claims 31 to 41, wherein the first configuration information is further used to indicate a preamble sequence format, or a value of a system frame number mod a random access configuration period.
43. The method according to any one of claims 31 to 42, wherein the time domain resource further comprises a sequence number of the slot or the subframe, and/or a quantity of ROs in one slot.
- 35 44. The method according to any one of claims 31 to 43, wherein the method is applicable to a frequency band above 6 GHz.
- 40 45. The method according to any one of claims 31 to 44, wherein a subcarrier spacing corresponding to the control channel resource set is 60 kHz or 120 kHz.
46. The method according to any one of claims 31 to 45, wherein the time domain resource specifically comprises the first OFDM symbol occupied by the first RO in the slot or the subframe.
- 45 47. An apparatus, comprising a transceiver, a processor, and a memory, wherein the transceiver is configured to receive index indication information; and the processor is configured to determine first configuration information based on the index indication information, wherein the first configuration information is used to indicate a time domain resource for at least one random access preamble occasion RO; the time domain resource comprises the first OFDM symbol occupied by the RO in a slot or a subframe; and a sequence number of the first OFDM symbol in the slot or the subframe is twice a time domain length of a control channel resource set in the slot or the subframe, or is a sum of a sequence number of the first OFDM symbol in a control channel resource set in the slot or the subframe and one time a time domain length of the control channel resource set.
- 50 48. An apparatus, comprising:
a processor, configured to generate index indication information; and
a transceiver, configured to send the index indication information, wherein the index indication information is
- 55

used by the terminal device to determine first configuration information based on the index indication information; the first configuration information is used to indicate a time domain resource for at least one random access preamble occasion RO; the time domain resource comprises the first OFDM symbol occupied by the RO in a slot or a subframe; and a sequence number of the first OFDM symbol in the slot or the subframe is twice a time domain length of a control channel resource set in the slot or the subframe, or is a sum of a sequence number of the first OFDM symbol in the control channel resource set in the slot or the subframe and one time a time domain length of the control channel resource set.

49. An apparatus, comprising:

a transceiver unit, configured to receive index indication information; and
a processing unit, configured to determine first configuration information based on the index indication information, wherein the first configuration information is used to indicate a time domain resource for at least one random access preamble occasion RO; the time domain resource comprises the first OFDM symbol occupied by the RO in a slot or a subframe; and a sequence number of the first OFDM symbol in the slot or the subframe is twice a time domain length of a control channel resource set in the slot or the subframe, or is a sum of a sequence number of the first OFDM symbol in a control channel resource set in the slot or the subframe and one time a time domain length of the control channel resource set.

50. An apparatus, comprising:

a processing unit, configured to generate index indication information; and
a transceiver unit, configured to send the index indication information, wherein the index indication information is used by the terminal device to determine first configuration information based on the index indication information; the first configuration information is used to indicate a time domain resource for at least one random access preamble occasion RO; the time domain resource comprises the first OFDM symbol occupied by the RO in a slot or a subframe; and a sequence number of the first OFDM symbol in the slot or the subframe is twice a time domain length of a control channel resource set in the slot or the subframe, or is a sum of a sequence number of the first OFDM symbol in the control channel resource set in the slot or the subframe and one time a time domain length of the control channel resource set.

51. The apparatus according to any one of claims 47 to 50, wherein the sequence number of the first OFDM symbol in the slot is 2, 6, 8, or 9.

52. The apparatus according to any one of claims 47 to 50, wherein the first OFDM symbol is located at a starting time domain position of the slot or the subframe.

53. The apparatus according to any one of claims 47 to 52, wherein the first configuration information is determined based on time domain information of the control channel resource set.

54. The apparatus according to any one of claims 47 to 53, wherein the first OFDM symbol is located after a time domain position of a preset control channel resource set in the slot or the subframe.

55. The apparatus according to any one of claims 47 to 54, wherein the first OFDM symbol is located at a preset time domain position in the slot or the subframe.

56. The apparatus according to any one of claim 47 or 49, or claims 51 to 55, wherein the terminal device skips sending a preamble sequence on time domain resources for one or more ROs that conflict with a time domain resource for a common signal block.

57. The apparatus according to any one of claim 48 or claims 50 to 55, wherein the network device skips receiving a preamble sequence on time domain resources for one or more ROs that conflict with a time domain resource for a common signal block.

58. The apparatus according to any one of claims 47 to 57, wherein the index indication information is a PRACH configuration index.

59. The apparatus according to any one of claims 47 to 58, wherein the slot is a PRACH slot.

60. The apparatus according to any one of claims 47 to 59, wherein the first configuration information is further used to indicate a preamble sequence format, or a value of a system frame number mod a random access configuration period.

61. The apparatus according to any one of claims 47 to 60, wherein the time domain resource further comprises a sequence number of the slot or the subframe, and/or a quantity of ROs in one slot.

62. The apparatus according to any one of claims 47 to 61, wherein the apparatus is applicable to a frequency band above 6 GHz.

63. The apparatus according to any one of claims 47 to 62, wherein a subcarrier spacing corresponding to the control channel resource set is 60 kHz or 120 kHz.

64. The apparatus according to any one of claims 47 to 63, wherein the time domain resource specifically comprises the first OFDM symbol occupied by the first RO in the slot or the subframe.

65. A communication method, comprising:

receiving, by a terminal device, index indication information, wherein the index indication information is used to indicate a first configuration index; and
determining, by the terminal device based on the first configuration index, first configuration information corresponding to the first configuration index, wherein the first configuration information is used to indicate a time domain resource for a random access preamble occasion RO, and the first configuration information is determined based on time domain information of a control channel resource set.

66. A communication method, comprising:

generating, by a network device, index indication information, wherein the index indication information is used to indicate a first configuration index; and
sending, by the network device, the index indication information to a terminal device, wherein the index indication information is used by the terminal device to determine, based on the first configuration index, first configuration information corresponding to the first configuration index, the first configuration information is used to indicate a time domain resource for a random access preamble occasion RO, and the first configuration information is determined based on time domain information of a control channel resource set.

67. An apparatus, comprising:

a processing unit and a transceiver unit, wherein
the transceiver unit is configured to receive index indication information, wherein the index indication information is used to indicate a first configuration index; and
the processing unit is configured to determine, based on the first configuration index, first configuration information corresponding to the first configuration index, wherein the first configuration information is used to indicate a time domain resource for a random access preamble occasion RO, and the first configuration information is determined based on time domain information of a control channel resource set.

68. An apparatus, comprising:

a processing unit and a transceiver unit, wherein
the processing unit is configured to generate index indication information, wherein the index indication information is used to indicate a first configuration index; and
the transceiver unit is configured to send the index indication information to a terminal device, wherein the index indication information is used by the terminal device to determine, based on the first configuration index, first configuration information corresponding to the first configuration index, the first configuration information is used to indicate a time domain resource for a random access preamble occasion RO, and the first configuration information is determined based on time domain information of a control channel resource set.

69. The method according to claim 65 or 66, or the apparatus according to claim 67 or 68, wherein a sequence number of the first OFDM symbol for the RO in the slot is twice a time domain length of the control

channel resource set in the slot.

- 5 70. The method according to claim 65 or 66, or the apparatus according to claim 67 or 68, wherein a sequence number of the first OFDM symbol for the RO in the slot is a sum of a sequence number of the first OFDM symbol in the control channel resource set in the slot and one time a time domain length of the control channel resource set.
- 10 71. The method according to claim 69, or the apparatus according to claim 69, wherein the sequence number of the first OFDM symbol for the RO in the slot is 2, 6, or 8.
72. The method according to claim 70, or the apparatus according to claim 70, wherein the sequence number of the first OFDM symbol for the RO in the slot is 9.
- 15 73. The method according to claim 65 or 66, or the apparatus according to claim 67 or 68, wherein the first OFDM symbol for the RO is located after a time domain position of a preset control channel resource set in the slot.
74. The method according to claim 65 or 66, or the apparatus according to claim 67 or 68, wherein the first OFDM symbol for the RO is located at a preset time domain position in the slot.
- 20 75. The method according to claim 65 or 66, or the apparatus according to claim 67 or 68, wherein the first OFDM symbol for the RO is located at a starting time domain position of the slot.
- 25 76. An apparatus, configured to perform the method according to any one of claims 1, 2, 5 to 23, 31 to 46, 65, 66, and 69 to 75.
77. An apparatus, comprising a processor, wherein the processor is coupled to a memory; the memory is configured to store a computer program; and the processor is configured to execute the computer program stored in the memory, so that the apparatus performs the method according to any one of claims 1, 2, 5 to 23, 31 to 46, 65, 66, and 69 to 75.
- 30 78. A readable storage medium, comprising a program or an instruction, wherein when the program or the instruction is run on a computer, the method according to any one of claims 1, 2, 5 to 23, 31 to 46, 65, 66, and 69 to 75 is performed.
- 35 79. A computer program product, wherein when being executed by a computer, the computer program product is configured to implement the method according to any one of claims 1, 2, 5 to 23, 31 to 46, 65, 66, and 69 to 75.
80. A processing apparatus, comprising a processor and an interface, wherein the processing apparatus is configured to perform the method according to any one of claims 1, 2, 5 to 23, 31 to 46, 65, 66, and 69 to 75.
- 40 81. A processing apparatus, comprising a memory, a processor, and an interface, wherein the memory is configured to store a computer program, and the processor is configured to invoke the computer program from the memory and run the computer program, so that the processing apparatus is configured to perform the method according to any one of claims 1, 2, 5 to 23, 31 to 46, 65, 66, and 69 to 75.
- 45 82. A system, comprising:

the apparatus according to claim 3 and the apparatus according to claim 4; or
the apparatus according to any one of claims 5 to 17 and 24 to 30; or
50 the apparatus according to any one of claim 47 or 49 and the apparatus according to any one of claim 48 or 50; or
the apparatus according to any one of claims 51 to 64; or
the apparatus according to claim 67 and the apparatus according to claim 68; or
the apparatus according to any one of claims 69 to 75.

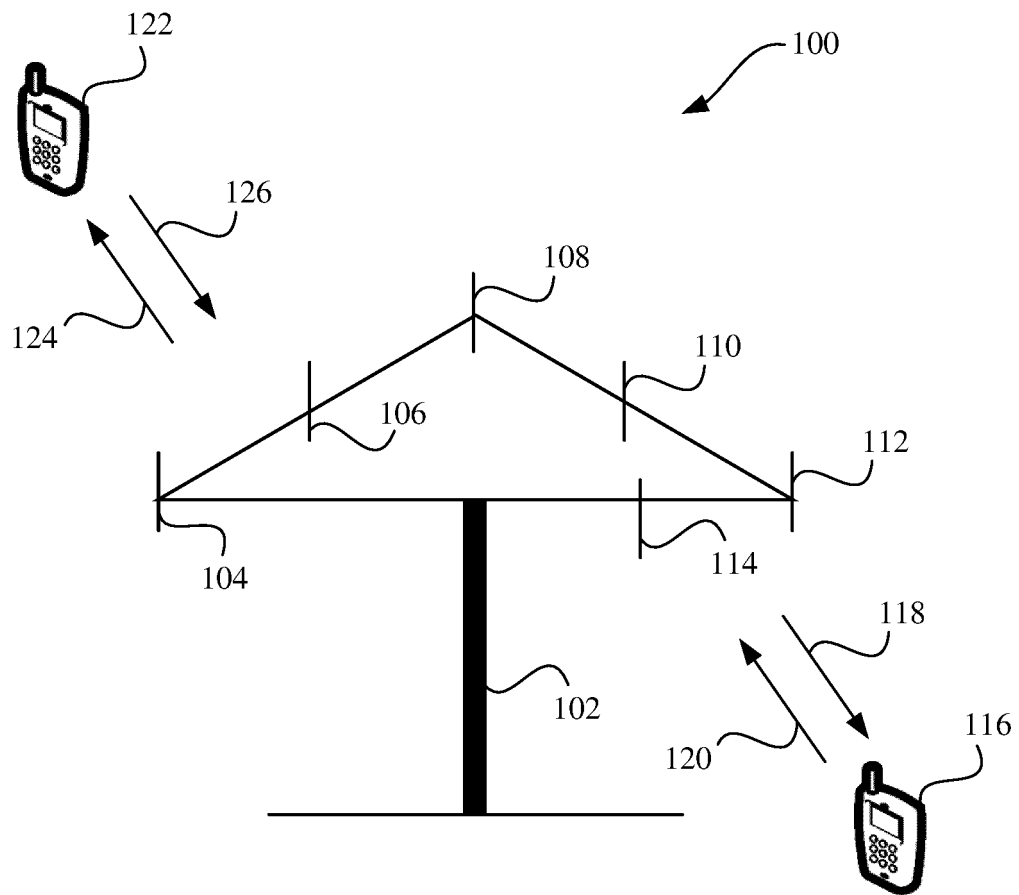


FIG. 1

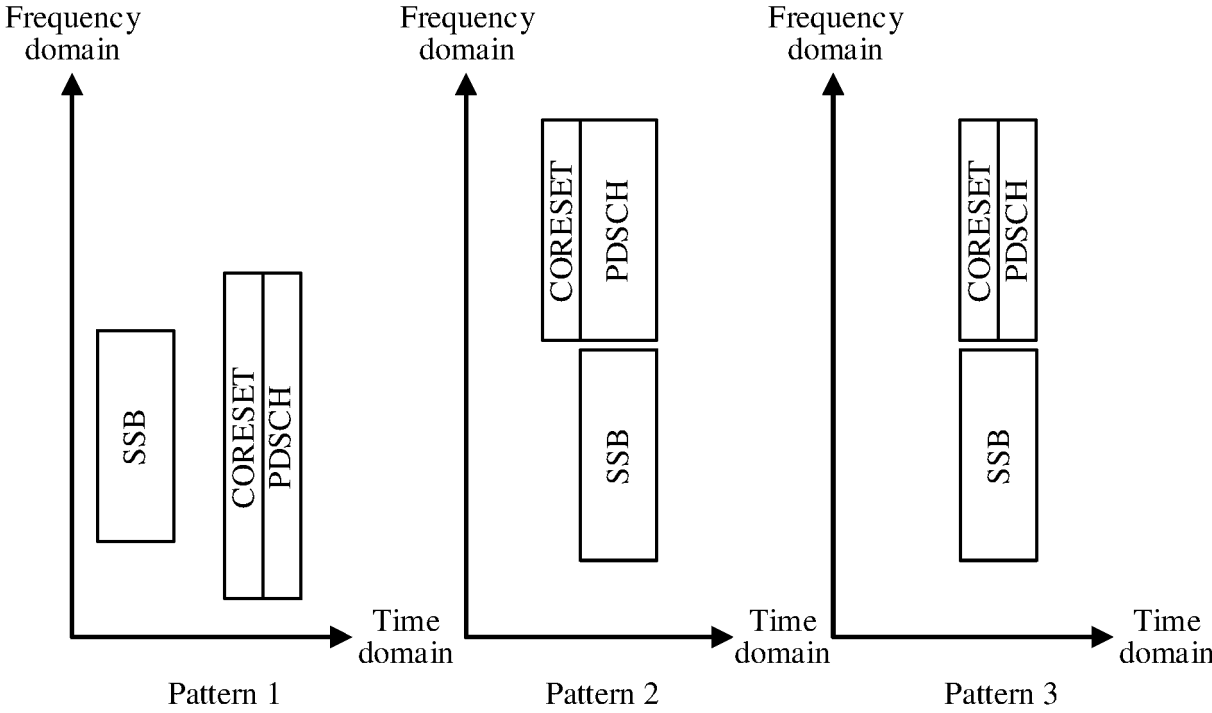


FIG. 2

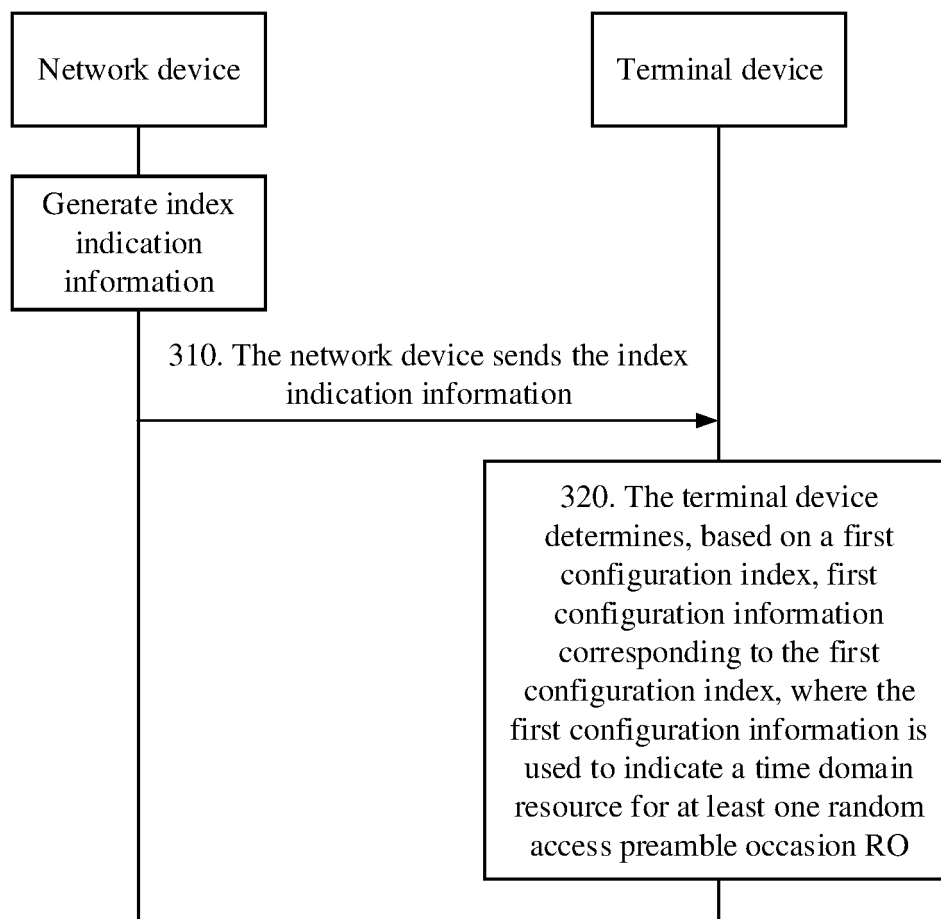


FIG. 3

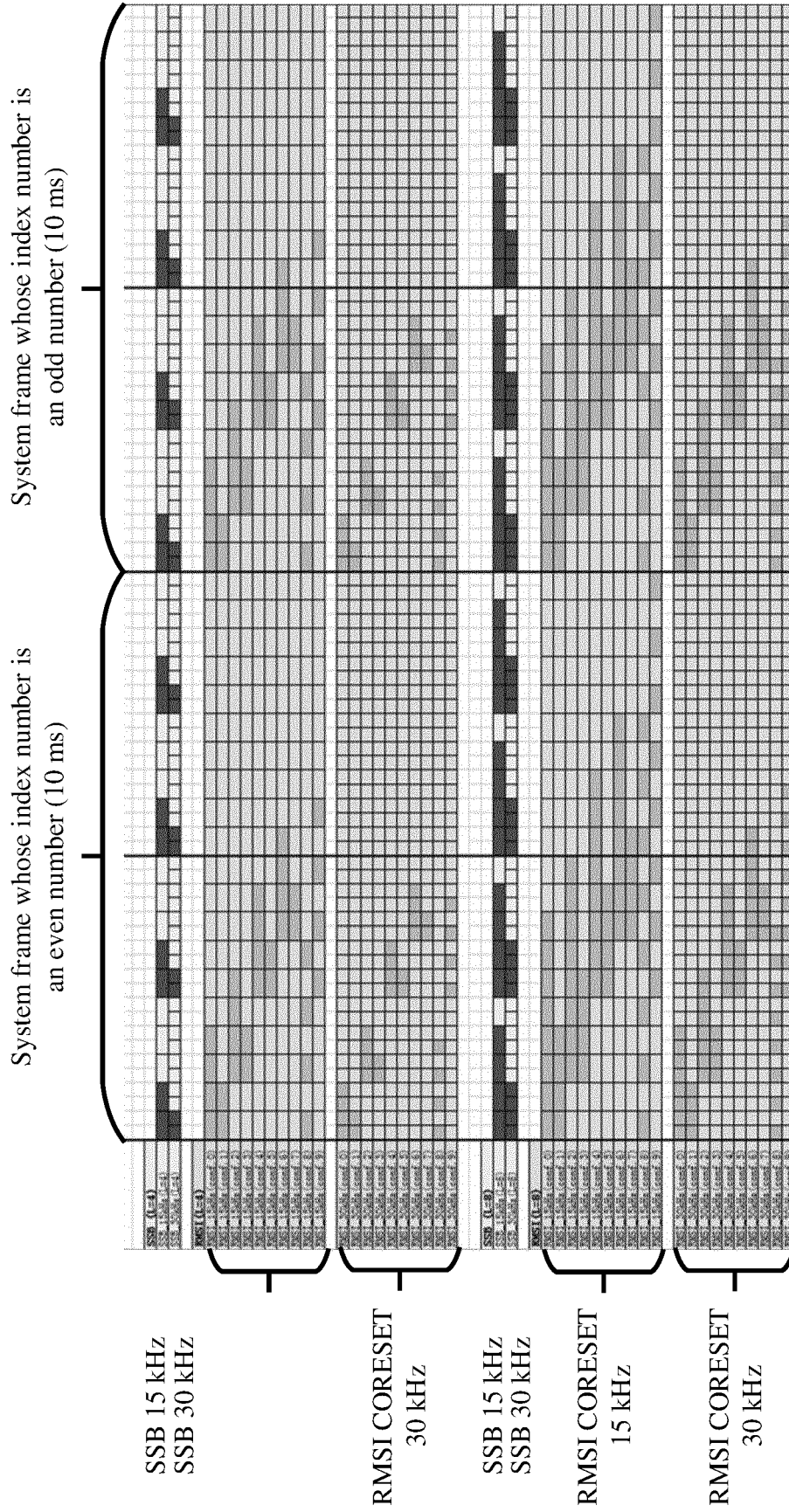
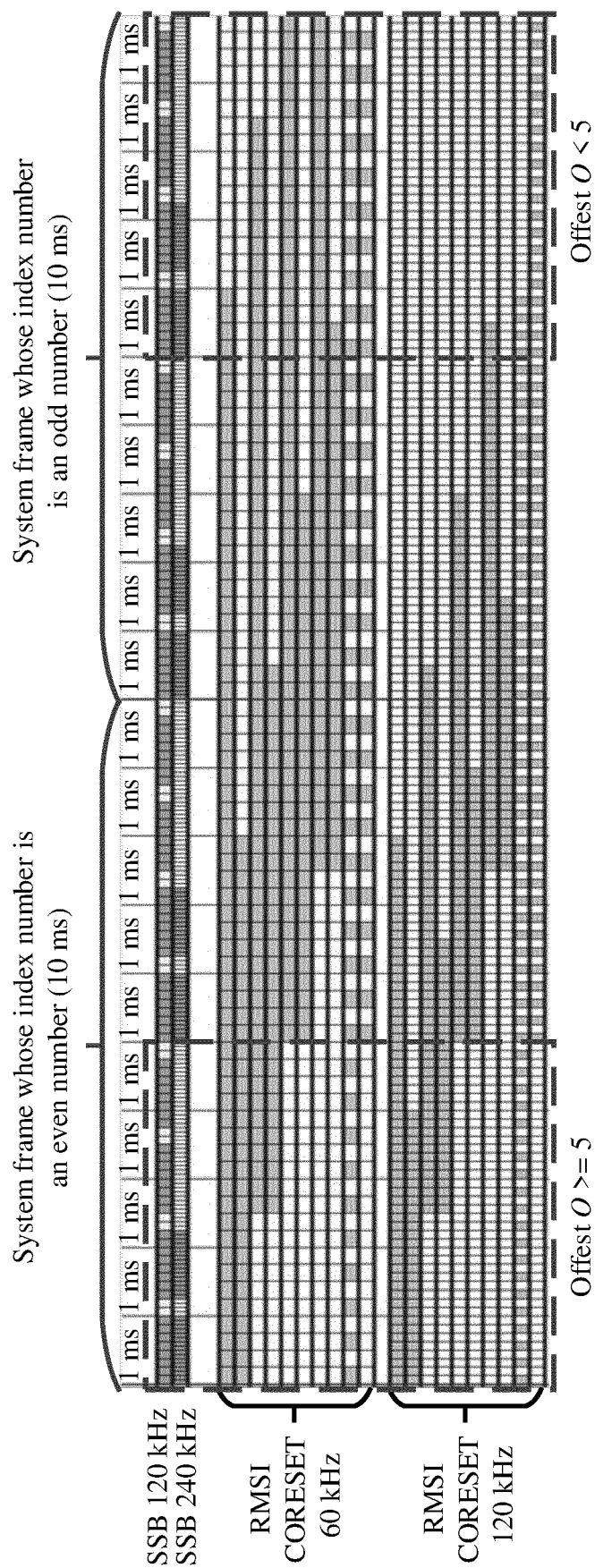


FIG. 4



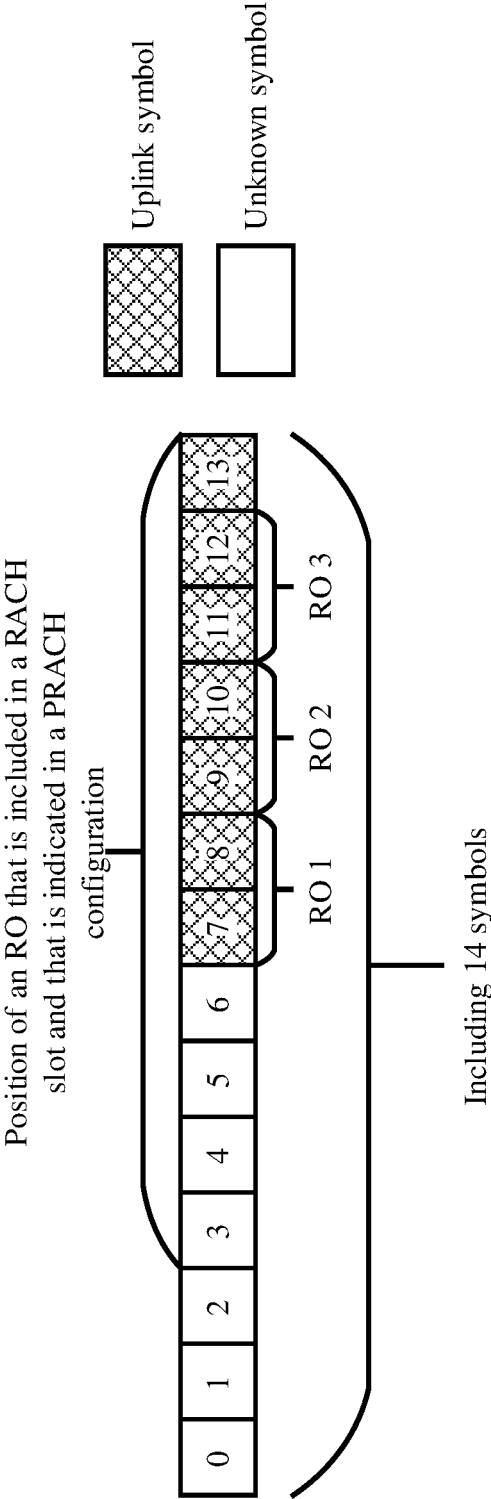


FIG. 6

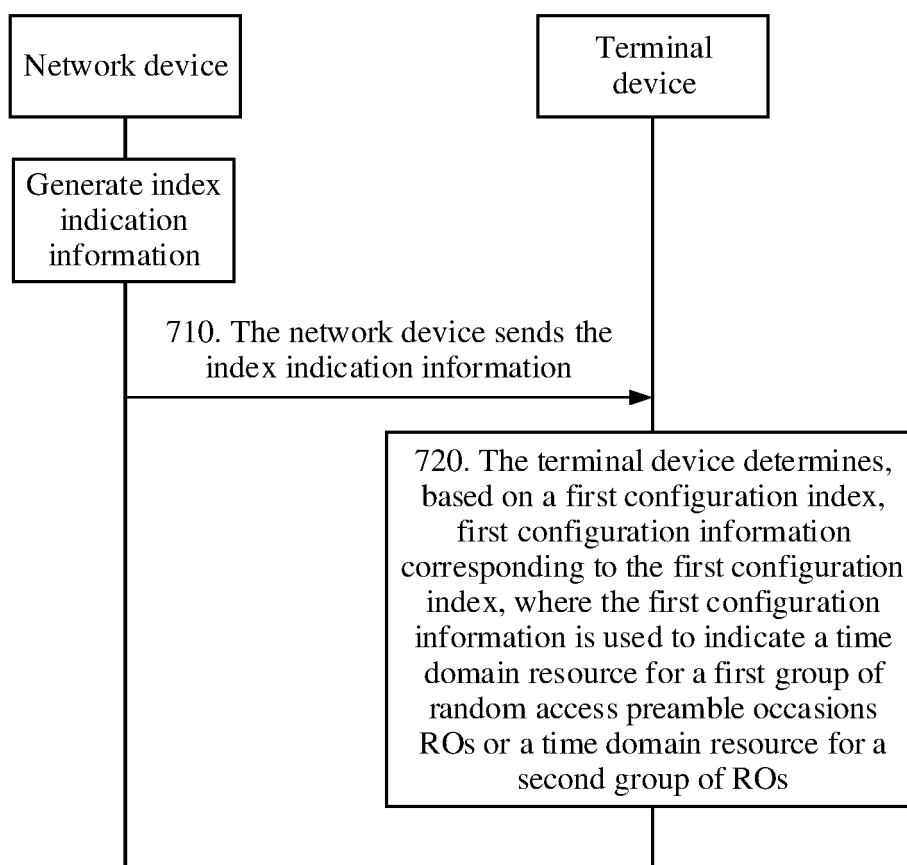
700

FIG. 7

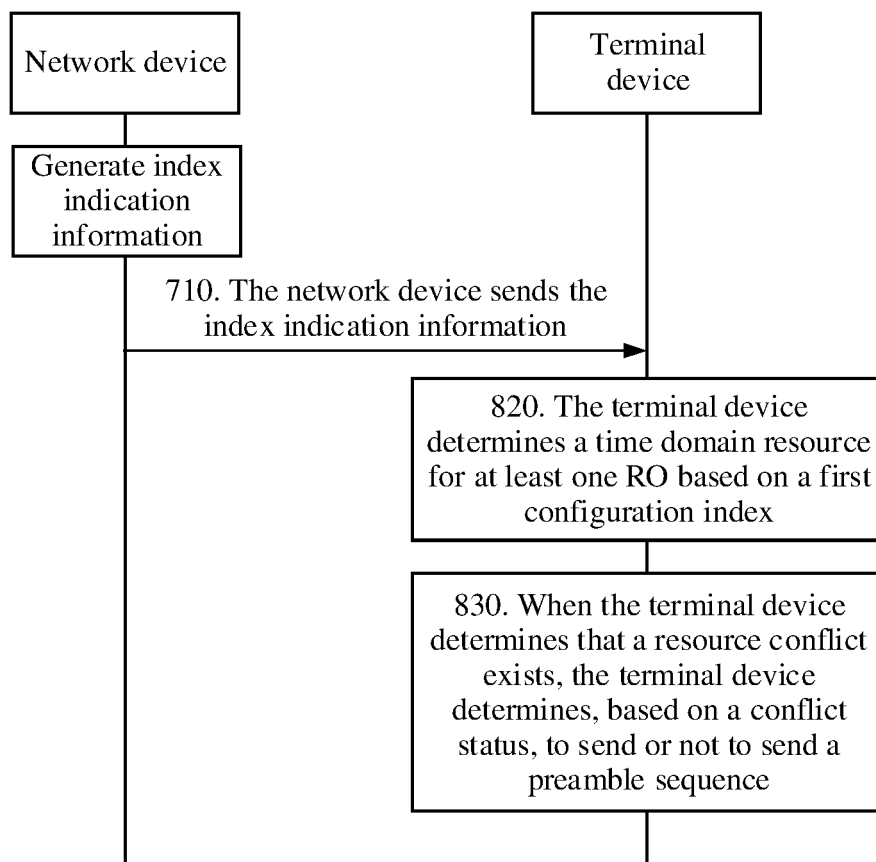


FIG. 8

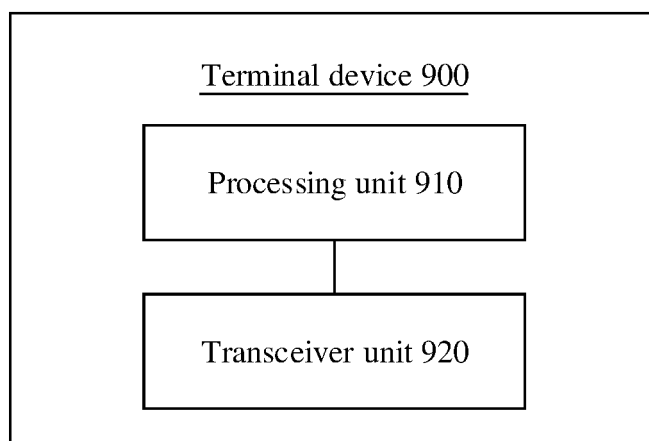


FIG. 9

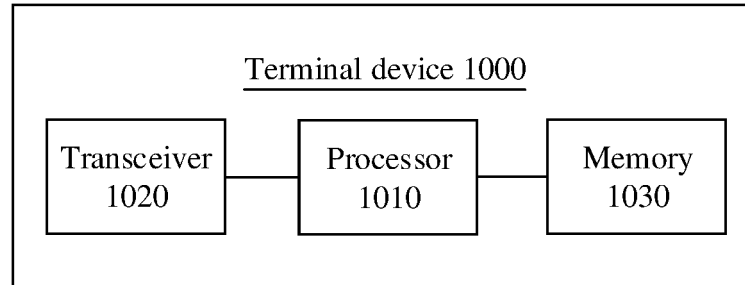


FIG. 10

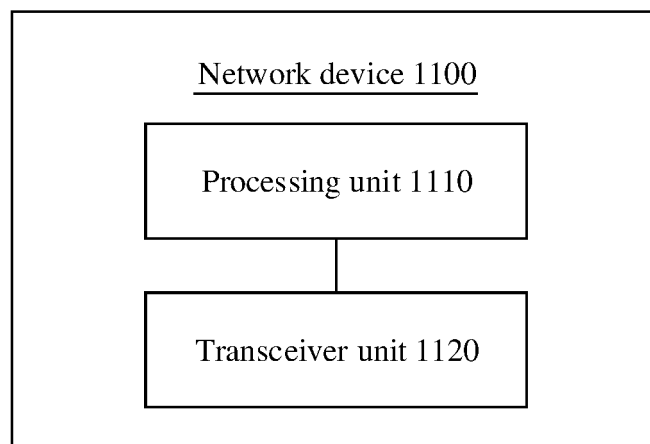


FIG. 11

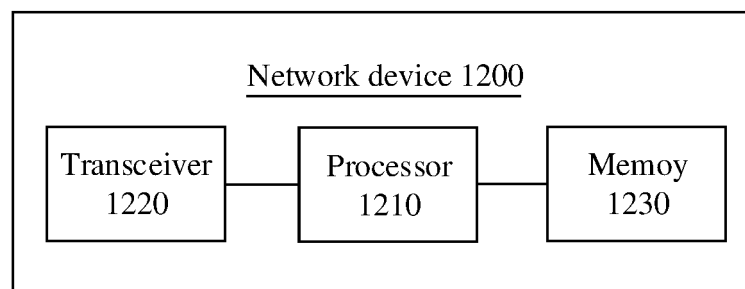


FIG. 12

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/075023

A. CLASSIFICATION OF SUBJECT MATTER

H04W 72/04(2009.01)i; H04L 5/00(2006.01)i; H04W 74/08(2009.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H04W; H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

VEN; EPTXT; USTXT; WOTXT; CNABS; CNTXT; CNKI; 3GPP: 随机接入前导时机, 时机, 前导, 公共信号块, 索引, 时域, 时间, index, ro, ssb, occasion, random access occasion, preamble, RMSI CORESET

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	HUAWEI et al. "Remaining Issues in RACH Procedure" 3GPP TSG RAN WG1 Meeting #91 R1-1719374, 18 November 2017 (2017-11-18), sections 2-6	1-82
A	ZTE et al. "PRACH Resource Configuration" 3GPP TSG RAN WG1 Meeting #91 R1-1719345, 18 November 2017 (2017-11-18), entire document	1-82
A	CN 104285491 A (BLACKBERRY LIMITED) 14 January 2015 (2015-01-14) entire document	1-82

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

03 April 2019

Date of mailing of the international search report

30 April 2019

Name and mailing address of the ISA/CN

State Intellectual Property Office of the P. R. China (ISA/
CN)
No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing
100088
China

Authorized officer

Facsimile No. (86-10)62019451

Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2019/075023

5

10

15

20

25

30

35

40

45

50

55

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	104285491	A	14 January 2015	EP	2670206	A1	04 December 2013
				US	2013301541	A1	14 November 2013
				WO	2013166591	A1	14 November 2013
				CN	104285491	B	06 January 2016
				KR	20150013482	A	05 February 2015
				EP	2670206	B1	14 September 2016
				US	8989113	B2	24 March 2015

Form PCT/ISA/210 (patent family annex) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- CN 201810152230 [0001]